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SESSIONAL PAPERS.

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VOL. XX.—PART I.

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SECOND SESSION OF SIXTH LEGISLATURE

OF THE

PROVINCE OF ONTARIO.

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SESSION 1888.

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1888.



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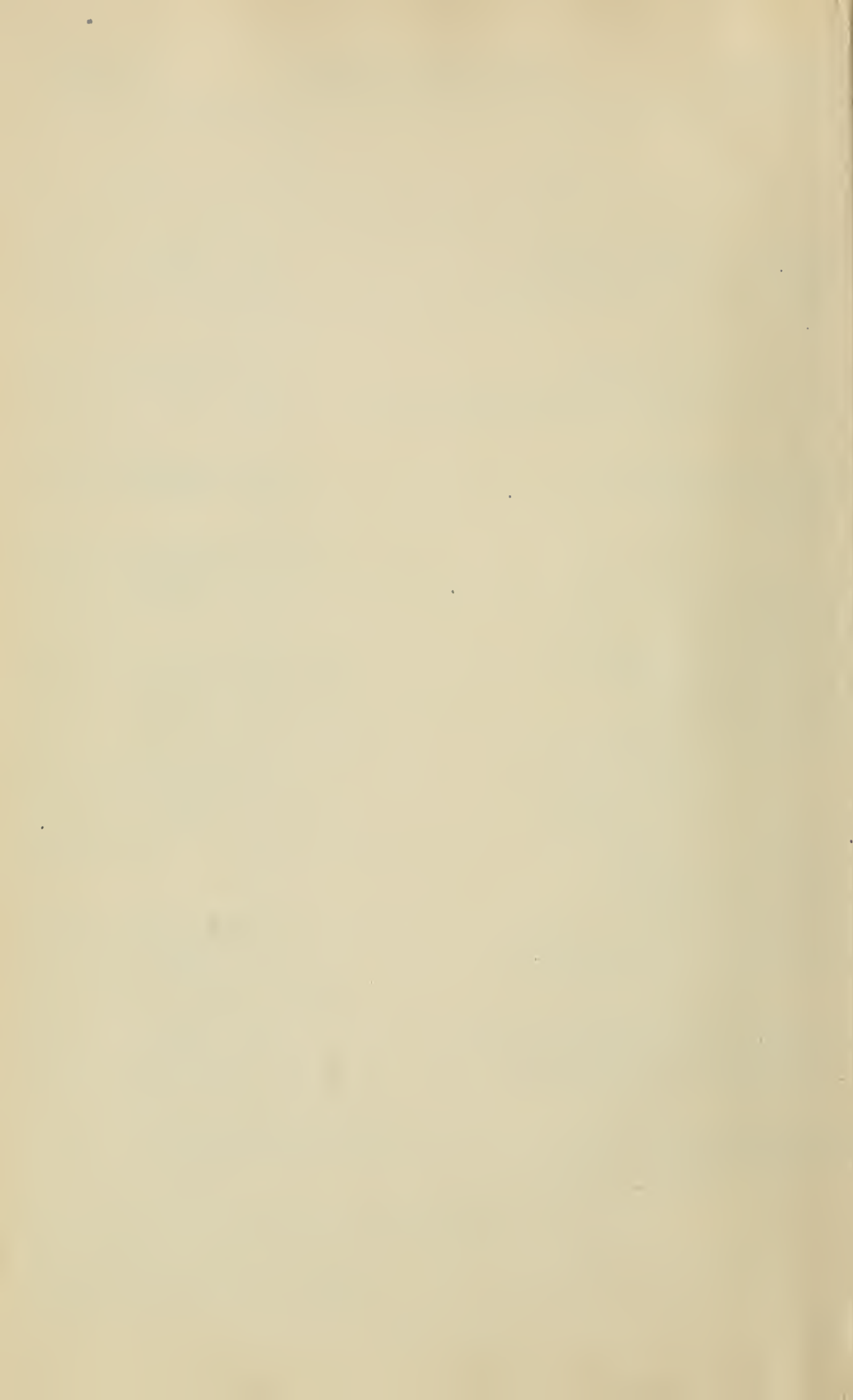
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# REPORT

OF

E. B. BORRON, STIPENDIARY MAGISTRATE,

1886,

ON THAT PART OF

## THE BASIN OF HUDSON'S BAY

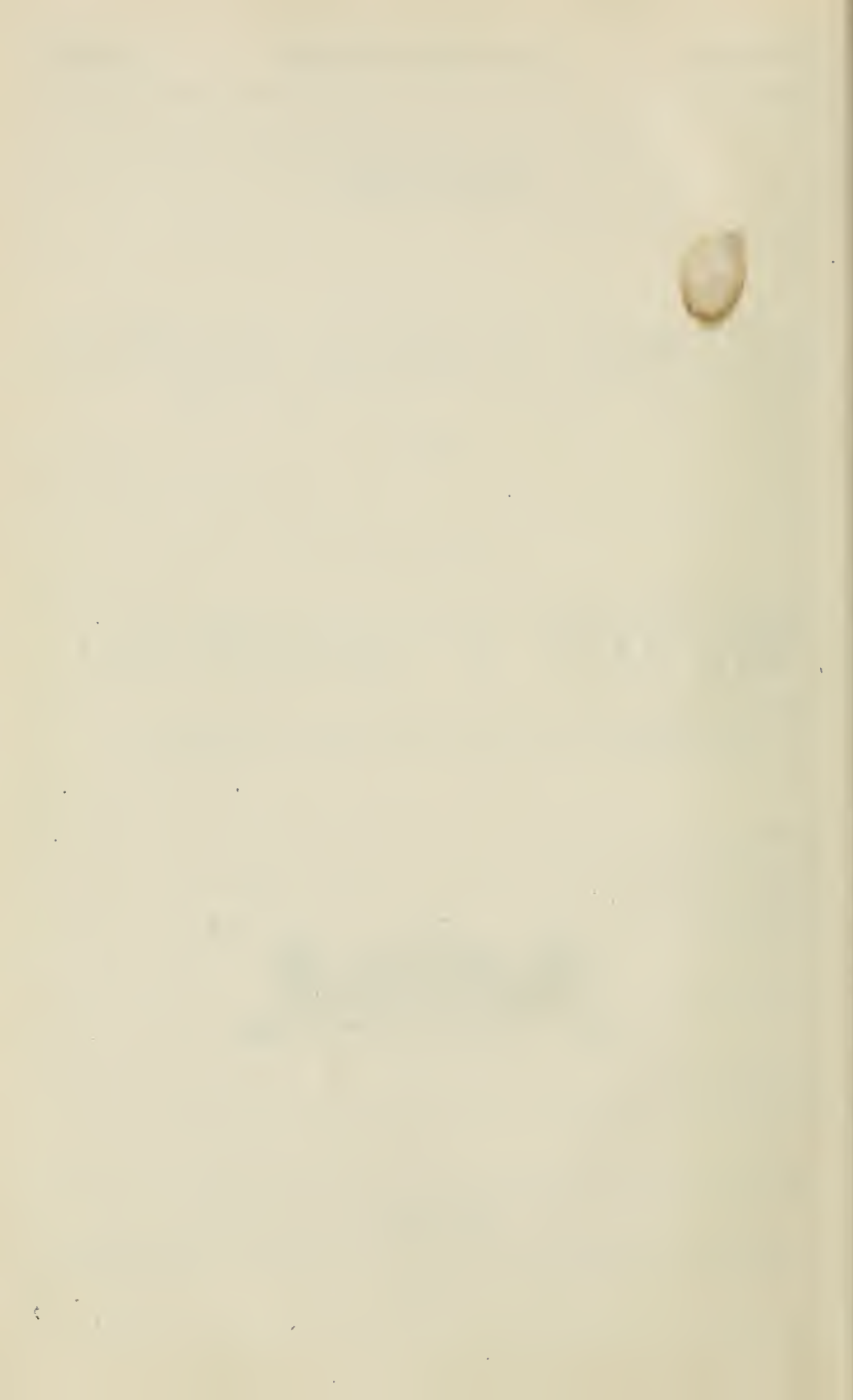
BELONGING TO THE PROVINCE OF ONTARIO.



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1888.



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COLLINGWOOD, 30th April, 1887.

HON. O. MOWAT,  
Attorney-General, Toronto.

SIR,—I have the honour to transmit herewith, Report of last season's explorations in the Provincial Territory lying to the North of the Height of Land and West of Missanabie River.

The Honourable Hudson Bay Company's officers in charge of the posts at Missanabie, Michipicoten and Chapleau, have, as usual, rendered me every assistance in their power.

I have the honour to be, Sir,

Your obedient servant,

E. B. BORRON,  
Stipendiary Magistrate.

## REPORT

OF

E. B. Borron, Esq., Stipendiary Magistrate,

ON THAT PART OF THE

## BASIN OF HUDSON'S BAY

BELONGING TO

THE PROVINCE OF ONTARIO.

This season my explorations have been for the most part confined to the country on the west side of the Missinabie river, opposite, or nearly so, to the tract examined the previous year.

It includes Brunswick Lake and the Hon. Hudson's Bay Company's post, called New Brunswick House, frequently mentioned in former Reports. The fertility of the soil at this post has been long known to the Hudson Bay Company's officers, and the climate is believed to be equal if not superior to that which prevails at Port Arthur or Thunder Bay. All the principal roots and grains are said to grow well at New Brunswick, and come to full maturity. Clover, timothy and other grasses grow splendidly, as do, also, currants, strawberries, raspberries, and other small fruits.

Mr. Gladman, an ex-Chief-Factor in the Hudson Bay Company's service, who was stationed for some years at this post, has given satisfactory evidence on these points, the truth of which has been confirmed by my own observations and enquiries.

No reliable information, however, was in our possession as to the extent of this fertile tract, nor as to the best way of opening it up.

Indians had told me at different times that the country on the west side of the Missinabie river—between the Lower Swampy-Ground, so called, on the south, and the Albany Branch on the north—was of a drier and less swampy nature than in most other parts of the territory they were acquainted with—that the soil was principally clay, and that the timber consisted chiefly of Aspen and Spruce.

To obtain for the Government fuller and more reliable information on these important points has been the chief object of my explorations this year.

In order to do this, I left Collingwood on the 29th of May for Toronto, and having forwarded necessary supplies, I proceeded from thence to Missinabie Station, on Dog Lake, by the Canadian Pacific Railway. Here, as previously arranged, I was met by John Driver, who had come from Sault Ste. Marie by steamer to Peninsula Harbour on Lake Superior, and from thence by the Canadian Pacific Railway, bringing with him a canoe and such part of my camping equipage and supplies as had been forwarded by steamer from Collingwood.

The route which I thereafter proposed taking was for some distance the same as that followed in 1884, namely, through Lakes Wabaton-gushene and Oba, and down the river Oba to the forks. The water of the east fork or branch, my guide then told me, ran into the Missanabie river, where it was known to *voyageurs* under the name of the Albany Branch. The waters of the other and larger branch, flowing as was demonstrated that year, first of all into Lake Kabinakagami, and thence by the Kabinakagami river into the Kenogami or English river, at a point named Mamattawa, where this branch of the Oba is called "White-Mud river." The Kenogami, or English river, joins the Great Albany river about 120 miles above Albany Factory on James Bay.

It was now my intention to follow the eastern branch of the Oba from the forks to its alleged junction with the Missanabie or north branch of Moose river, as this branch and its tributaries appeared to afford greater facilities for the exploration of the territory lying to the west and north of Brunswick Lake than any other. From the junction of this branch with the Missanabie, when reached, I proposed working my way back by the Missanabie and Brunswick rivers to the Height of Land.

This tract, bounded by the Missanabie river on the east, by the Pazhushkootai or Mazaskoda river on the south, by the main Oba river on the west, and by the east or Albany Branch on the north, includes nearly one thousand square miles of land, or sufficient to form about forty townships.

I did not expect to be able to make a minute examination of so large a tract, but such an exploration only as would enable me to report generally in regard to the leading features of the country.

Before starting out from Dog Lake it was necessary to procure guides, and also another canoe. I was, consequently, obliged to go to the Hon. Hudson Bay Company's post at the north-eastern extremity of Lake Missanabie, some forty miles distant from the Canadian Pacific Railway station on Dog Lake. Here, with the kind aid and assistance of Mr. Gilbert Spence, the officer in charge, I was able to obtain a canoe and the services of three *voyageurs* and guides, one of whom (Geedon) had accompanied me down the Oba in 1884, and was also with me for a short time in 1885.

Returning to Dog Lake, it was the 15th of June before I could make a final start, as some further delay had been occasioned by the negligence of the Canadian Pacific Railway officials in carrying necessary supplies from Toronto—past Missanabie and Lochalsh stations—to Port Arthur.

It is not necessary to describe either Dog Lake or Mattagami (the two forming one and the same lake, at all events in the spring); nor lakes Wabaton-gushene and Oba, the former of which is south, and the latter north, of the watershed. There is little land fit for cultivation on any of these lakes, although here and there areas of limited extent may be found. The whole surface, however, supports a growth of mixed timber, consisting of pine, spruce, tamarac, cedar, aspen, poplar, balsam and birch timber, which, although poor as compared with that found in localities more favourably situated in respect of soil and climate, is absolutely certain, sooner or later, to prove of value to the Province.

The river Oba, from its source to the forks, a distance of about thirty-five miles, pursues a north north-easterly course. The descent or fall is roughly estimated at seventy or eighty feet, and four portages are necessary, varying in length from 250 to 400 yards.

In this stretch, only one tributary falls into the Oba with sufficient depth of water to be navigable even by a light, medium-sized canoe. This is called "Coat river." It occurs on the east side, and about half way, or say seventeen miles below lake Oba. I ascended this stream as far as practicable, and found that it had its source in a small lake about four miles only from the Oba.

From the forks to the first portage, on the east branch of the Oba (which is called Madawugon by the Indians), was found to be about  $2\frac{1}{2}$  miles. This portage is situated on the south side of the river, and is about 600 yards in length. The fall in the river at this point is roughly estimated at about thirty-five feet.

Three miles below this, a small stream enters on the north; and about five miles below the portage, or say eight miles from the forks, a larger tributary, called the Beaver-



tanning river, falls in on the south side. This was ascended, as far as navigable, and the adjacent country explored.

We then resumed our voyage down the Oba, and seven miles more brought us to the second portage. This is on the north side of the middle channel, the river here being split or divided into three branches or channels. It is about 500 yards in length, and the fall in the river at this point, inclusive of the rapids below the portage, is not less than forty-five feet. The country on both sides was examined in the vicinity of this portage.

The third portage was met with about four miles from the above. It is about 275 yards in length, and situated on the left, or north, bank of the river. The fall here is about twelve feet.

In little over half an hour, or say  $1\frac{1}{2}$  miles from the third, we came to the fourth portage. This is on the south side, and 250 miles in length; and the fall in the rapids is about ten feet.

The 5th, 6th, 7th and 8th portages all occur in the next five miles. Including rapids, which were run, the fall is not less, I think, than 140 feet in this stretch. The longest of these portages was about a quarter of a mile.

A mile or so below the eighth portage we arrived at the junction of the Wango river, which flows into this east branch of the Oba from the south. This is the only navigable tributary, with the exception of the Beaver-tanning river, on this branch. Roughly estimated, the distance, by the river, between these two tributaries, is about nineteen miles, and from the forks of the Oba to the Wango, about twenty-seven miles.

I ascended the Wango as far as navigable; in all about fifteen miles. It was very shallow, however, in many places, and at others obstructed with fallow and drift-wood. Such portages, too, as were necessary, had to be either made anew or enlarged for our canoes. I was able, however, to penetrate at this point, and to examine the interior of the tract of country I was specially anxious to see.

Returning to the junction, we descended the Oba, or Albany branch, as it is called, to the Missanabie, examining the land, from time to time, on both sides. This stretch of the river is full of rapids, and although only one more portage was necessary, the total descent or fall is considerable. The shallowness of the river, and number of rocky reefs and boulders retarded our progress greatly, and caused our speed to be so irregular that it was impossible to estimate the distance from the Wango river to the Missanabie in the usual manner. I think, however, that the length of this stretch is about ten miles, making the whole distance, from the forks of the Oba to where the eastern branch pours its waters into Missanabie river, about thirty-seven miles.

From this junction the Missanabie river was followed upward to where the Brunswick river enters it, when we ascended up that river to Brunswick lake, examining the country at intervals, more particularly on the west side.

The land on Brunswick lake was next explored, and all the streams which empty their waters into that lake were ascended as far as practicable in a light canoe. None of them were found, however, to be navigable more than a few miles at that season (July).

Thereafter I crossed over to the Missanabie again, and ascended what Dr. Bell calls the Pazhushkootai river, which enters on the west side, between the portage to Brunswick lake and Thunder-water rapids. My guide calls this river "Mazaskoda." But while willing to retain such Indian names as can be readily pronounced by white men, or which may be singularly appropriate, it would not be amiss, I think, in our Provincial maps, to curtail many of these names, if not change them altogether.

This stream is twenty or thirty yards in width near the junction, but diminishes, of course, as we proceed upward toward its source. I succeeded in ascending it about twenty-four miles, and was enabled to obtain important information in reference to the section of the country drained by it. Explorations, however, up this and other tributaries of the main rivers, should be entered upon as soon as possible after the ice leaves them in the spring, and prosecuted in the months of May and June when the water is high. In July and August many of them are almost, if not altogether, dry.

On completing this exploration, I descended the Missanabie river to the portage which leads to lake Opazatike, being anxious to ascend "Grassy river," the principal

feeder of that lake. This river was referred to in the report of my explorations last season as having been ascended for a short distance by one of my *voyageurs* (John Driver), who gave a favourable description of the soil and timber.

A short distance, however, above the point reached last year, Grassy river was found to be quite unnavigable, partly owing to the lowness of the water, but chiefly to obstructions by fallen trees and drift-wood. We were only able, therefore, to ascend this stream about four miles above the point previously attained by Driver.

Returning to the Missanabie river, the land on both sides of that river was examined at a number of points between Opazatika portage and the Hudson Bay Company's Post on Lake Missanabie.

On my arrival at this Post, three out of four of my guides and *voyageurs* wished to leave, being anxious to get their outfits or supplies and depart for their hunting grounds. Seeing little probability of being able to replace them with others at all suitable, and the smaller rivers having now become unnavigable, I concluded to return. This I did by the Michipicoten river and lake Superior route. I had, on starting out this season, intended, if practicable, returning from the Height of Land to Lake Superior, down Goulais river, but on enquiry I was led to believe that this route, if practicable at all, is only so very early in the season, before the subsidence of the spring floods. The upper portions of this river remain, as I believe, still unexplored.

With this brief narrative of my explorations this season, I shall now proceed to give such information as I may have obtained, and such opinions as I may have formed in reference to the country, under the usual heads.

#### LAND.

As frequently mentioned in former reports, the trifling elevation of the general surface above the rivers by which it is drained, and the flat or level character of this northern territory, are physical features very unfavourable to the natural fertility of the land, and to the spontaneous production or growth of those plants and animals apparently, if not really, of the greatest value and importance to mankind. These features are more especially noticeable in that section or portion of the country bordering on James' Bay, from near Rupert's House to Albany Factory, at the mouth of the Albany river, and extending inland from the coast in a south-westerly direction from one hundred to two hundred miles. The loose surface material in this region rests on nearly horizontal beds of limestone, sandstone, and other stratified rocks, which are there found at no great depth. The soil, or the sub-soil, is almost invariably composed largely of alumina, forming with silica and lime, clays and marls, more or less heavy, and retentive of moisture. This circumstance, coupled with the low, flat nature of the country, is unfavourable to good natural drainage, and the land is almost universally cold and wet, unless situated on or near the banks of the rivers. These conditions have favoured the growth of sphagnum or bog-moss, resulting in the formation of the peat-mosses or bogs, which now cover so large a proportion of this northern zone or belt. They are called muskego, or muskegs, by the natives.

A "muskeg" differs materially from what is commonly understood by the term "swamp," as those know who have seen both. In this territory, the peat mosses or muskegs may, and in fact generally do, occupy the higher ground—those parts of the plateau which are rarely, if ever, flooded or inundated by the water of the rivers. The swamps, on the other hand, usually occupy the lower ground, on or near rivers and lakes, and are liable to be flooded to a greater or less depth periodically, more particularly at the time of the spring freshets, occasioned by the melting of the snow which falls and accumulates on the ground and in the woods during the winter. The muskeg of the north is deeply carpeted with bog-moss, and with the moss may be found a few plants and shrubs, such as are generally seen growing on peat bogs elsewhere. If there be any trees they consist of stunted and sickly looking tamarac and spruce, thinly scattered and of no economic use or value whatever. The soil in the swamps, although wet, is frequently good, and often supports a vigorous and healthy growth of forest trees, chiefly spruce and tamarac, and if not overcrowded or situated too near the coast, such trees attain useful size.



There can be no question, however, that the great predominance of muskeg and swamp in this disputed territory and the causes to which it is due, detracts greatly from its value in an agricultural point of view.

On the Mattagami, Missanabie and Abitibi branches of Moose River, the stratified or sedimentary rocks appear to crop out or terminate at or about what are called the long portages. These portages are from ninety to one hundred and twenty-five miles distant from Moose Factory, which is itself situated at or near the mouth of Moose River. Commencing at the lower end of these long portages, the country to the south rises some 300 feet in the next ten miles or so, and we enter upon what I have called the central plateau of this territory. Underlying the loose material (mostly drift) which here forms the surface, we have hitherto discovered no stratified rock, but only those belonging to the older Huronian and Laurentian systems. It is in the upper or southern portions of this plateau, that Lakes Opazatika and Brunswick, and those sections of the country upheld the last two seasons are, for the most part, situated.

Although these rocks do not, in this plateau, rise often, or to any considerable height above the general surface, they are frequently met with in the banks of the rivers and on the shores of the lakes.

Running as they appear to do in reefs having an easterly and westerly bearing, and intersected, as they are, by numerous powerful trap-dykes having generally a northerly course or bearing, the bed rock, unlike that underlying the great plain to the north, is very uneven and imparts to some extent, a corresponding unevenness of the surface. In consequence of this (or partly at least) this land in this plateau frequently appears in the form of ridges or knolls with depressions occupied by shallow lakes, marshes or swamps. As compared with the plain below, the area in proportion to the whole, of muskeg, is very much less, and that of the dry land greater, in this central plateau.

That portion of this plateau, to an examination of which my attention has been chiefly devoted this season, does not appear to include much muskeg, properly so-called. But there is undoubtedly a great deal of swampy land, especially in the south-west part.

Notwithstanding this, I am satisfied that within the bounds specified, there is a larger proportion of easily reclaimed arable pasture and meadow land fit for settlement in this tract than any other of equal extent and equally accessible in the territory.

No step, however, can be safely or prudently taken toward opening up and developing any part of this northern territory or any of its resources until the boundary question is settled and the Indian claims decided.

It is difficult to describe intelligibly a larger tract of land of which no instrumental survey has been made, and in which only a very few points (such as portages or the junctions of rivers) can be found having any known or recognized names to refer to.

For this and other reasons, therefore, I have thought it better to lay down on a map of the country much of the information which I have been able to procure in reference to the land in this part of the territory.

In regard to the soil, I may say, however, that the best soil here, as elsewhere in this territory, is the alluvial. This is met with of course on the river bottoms, and much of it is flooded for a longer or shorter period in the spring. The water, however, subsides rapidly after the snow is melted, and I have no doubt valuable crops can be raised from the greater part of this bottom land after the flood has abated. The sub-soil on these bottom lands is 'universally clay or marl, but sometimes there rests on this a sandy or sandy-loam soil of variable thickness.

On the higher ground clay or marl is almost always met with, either immediately at the surface or within two feet of it. It is the same as the drab or light coloured clay soil, which has proved so fertile under cultivation at New Brunswick Post. In some places the soil was found to be a sandy loam, but this was very generally observed to repose, at no great depth, on clay marl. Limited areas of very light sandy soil were met with in a few localities. One (especially noticeable) occurs about twenty-four miles up the Pazhushkootai river (of Dr. Bell's map). It is situated on the east side of the river and forms ridges, or rather mounds, sixty or seventy feet in height, from the top of which a better view of the surrounding country can be obtained than anywhere else in that section of the country.

Although little real muskeg was met with in the tract explored this season, there is undoubtedly a good deal of land that is wet, cold, and covered with sphagnum moss to a greater or less depth. These sections are sufficiently elevated above the rivers, but have almost invariably a clay soil, and are so level or flat that the water cannot run off.

It is only, in my opinion, the frequency of bush fires which prevents the accumulation of peat to such a thickness or depth as would convert extensive areas of this land into peat bogs or muskegs. As we now find it, much land of this description could be very easily and cheaply drained and rendered, if not arable, at all events fit for pasture or the growth of trees. I never visit New Brunswick Post that I am not favourably impressed with the luxuriance of the grass, more especially of the red clover and timothy, and I have no doubt that there are other cultivated grasses that would succeed equally well on this soil.

One very important question is yet undecided in regard to this territory, and that is, will fall wheat succeed? To this question no certain answer can be given, for no trial has ever been made. The soil, however, will, I believe, produce good crops of wheat, and the summer temperature is sufficient to fully mature them. The only point on which there is the least doubt or misgiving in my mind is whether the wheat plant will come through uninjured? Now on this point I am decidedly of opinion that it will stand the winter in this territory very much better than Manitoba, or probably any other part of the North-West. A thick mantle of snow covers the ground the whole winter in this territory, which should protect the wheat plant from the frost, for the cold is not more severe than at Winnipeg in any part of this central plateau. I think, therefore, it is, to say the least, exceedingly probable that fall wheat may prove a reliable and good crop.

If Ontario's title to this territory had been confirmed and placed beyond doubt or dispute, one of the very first things I should have suggested would have been such practical tests or experiments as would have set all doubts on this subject at rest.

Indeed several years ago I called the attention of the Government to the importance of experimental farms. See Report for 1884, pp. 24 and 25.

The Federal Government is, I observe, establishing such farms in various places in the Dominion, but of a very much more costly description than I suggested.

I must confess, too, that I am disappointed to learn that some of these farms are located in comparatively old and rich settlements, in which intelligent practical farmers with abundant capital have been experimenting for years, if not generations, and have in regard to many of the more important crops, already proved what the country is capable of producing; whereas a vast territory like this, and districts like Algoma, Nipissing and others, in regard of the soil and climate of which, and their special fitness for the growth and production of many important crops, so little is known, have been entirely overlooked.

#### RECLAMATION OF WASTE LAND.

In view of the prodigious quantity of wet and swampy land in this territory, it may not be out of place to offer a few suggestions which would, in my opinion, if carried out, reclaim large tracts and render them fit either for settlement or for the growth of much finer and more valuable timber than they can possibly produce in their present condition.

As it is manifestly impossible to elevate or raise the general surface of the country above the rivers by which it is so imperfectly drained, the only alternative left to the engineer is to deepen, if possible, the beds or channels of these rivers, and thus lower the surface of the water.

This may appear a very serious, if not impossible undertaking, and one calling for an expenditure out of all proportion to the value of the land to be reclaimed. But the circumstances are so favourable in regard to many large tracts of low, marshy, and swampy land, that for these and other reasons which will afterwards appear, I think otherwise.

The descent or fall in the rivers from the Height of Land to James' Bay varies from 1,000 to 1,400 feet, and the distance from 250 to 300 miles, which gives an average fall of about four feet per mile.

If the loose material, consisting of glacial and post-glacial deposits, had covered the whole face of the country uniformly and to a great depth, it might have been of little or no importance of what the underlying or bed-rock had consisted.



With such a descent or fall as we find north of the Height of Land, the country could hardly have failed to have been well drained. The volume of water given off by the rivers is so great, especially in the spring and early summer, that the rapidity and force of the current must have excavated, in any loose material, channels several hundred feet below the general surface; and this territory would (in all probability, I think) have been naturally as well drained as most parts of the western prairies.

The depth of the glacial and post-glacial deposits on the palaeozoic plain lying to the south and west of James Bay, does not appear, however, to be very great at any point where I have had an opportunity of seeing and judging. Nowhere on the coast, from our Eastern Boundary near Rupert's river, to the Albany river, (our Western Boundary under the award of the Arbitrators) does this loose surface material appear to be more than thirty or forty feet in thickness, and in many places it is much less. It increases, however, in depth as we travel southward from the coast, and although the thickness may not exceed sixty or seventy feet on an average, it is sometimes, near the southern edge of the plain, not less than 200 feet in thickness. This latter depth would appear to be attained on the Abitibi river near New Post, and the material there is principally a drab coloured calcareous clay. In the western part of the territory the thickness of the clays, gravels and sands, as seen on the Albany and Kenogami or English rivers, is considerably less than on the eastern or Abitibi side. As the rivers crossing this flat country have already reached the underlying limestone and sandstone strata throughout the greater part of their length, the rate at which they are now wearing and deepening their channels is so slow as to be altogether unappreciable even in a lifetime. While little or nothing, therefore, can be expected from such deepening of the channels in this section, a great deal can be accomplished by the artificial drainage of the surface soil, and much land may be reclaimed even in the most northerly part of the territory. See Report for 1881-82, page 6.

In the higher central plateau the loose material rests upon Huronian and Laurentian rocks which (as already stated) rarely rise above the general surface, but cross the rivers at intervals, in the form of narrow reefs or ridges. It is at these points where the rapids and falls are met with, and where portages have to be made. Now, although there may be extensive river bottoms and a great depth of clay or sand in the intervals between these reefs, the water is so pooled or dammed back by them that the land on the banks is for the most part either wet and swampy, or liable to be flooded. Only as these reefs are worn away by the slow action of the water, can the intermediate beds of the river, however soft the material, be deepened and such lands reclaimed. These rock reefs once removed, the current in the stretches above would be so increased that the water would at once commence acting upon the soft or loose material which usually forms the bottom. Thus the channels of the rivers would be gradually deepened, and the surface of the water permanently lowered.

The effects as regards drainage would be precisely similar to those which would result if the adjacent land were raised above the general level of the rivers. Nor would the drainage of the land situated on the banks of the main rivers be the only advantage—every tributary, and even the feeders of the tributaries, would in some instances be lowered and their efficiency as drains thus greatly increased.

It is, therefore, to the destruction and removal of these reefs of rock, and in some instances of boulders only, which obstruct the flow and dam back the water of the main rivers, that the attention of the Engineer should be directed.

I have seen many, many rapids and falls in this territory, and more particularly on this central plateau, where every dollar thus expended would yield a very large return; and the time is not so remote as many think when, if the Government should be unwilling, private individuals and companies will undertake this noble work. I call it a "noble work" because if the man who plants a tree is entitled to be regarded as a benefactor of his kind, much more is he who by his enterprise, skill, labour and capital, reclaims from utter waste, thousands of acres of fertile land, which if needful, will grow whole forests of trees; or afford food for numerous families of men for generations to come.

In some instances, blasting alone is all that would be necessary in my opinion to

enable us to get rid of these reefs. The force of the water, aided by great masses of ice in the spring, would probably remove the broken rock out of the way.

It may and no doubt will be thought by many, altogether premature to launch out into operations of this kind, in view more particularly of the cost, and of the vast tracts of land in the Dominion fit for immediate settlement. But when we take into consideration the fact that the great natural forces, by means of which the drainage and reclamation of this land is to be effected, can only be brought into play *when* these rocky barriers or "dams" are removed; and that from the moment they are removed and these forces put in operation, many years must still elapse before the vast labour to be performed can be nearly completed, or the advantages expected more than partially realized, the importance of aiding and assisting nature, as it were, to break through and remove these rock ridges, can hardly fail to be seen and appreciated by those who have any faith in the progress and settlement of the country; or who believe as I do, that there is not in Canada or the United States an acre of land which, under cultivation, can be made to yield a hundred bushels of potatoes or a ton of hay, that will not, sooner or later, be eagerly sought for and highly valued.

#### TIMBER.

Second only in importance to the fertility of the soil, and its fitness for agriculture or pastoral pursuits, is the value in an economic point of view of the products of the forest.

Very little white pine grows on this central plateau west of the Groundhog river, or of either red or white pine west of the Missinabie. Between the Missinabie and Groundhog, however, red pine occurs frequently in the southern portion of this plateau; considerable groves of it, and not a few white pine, may be found growing in the neighborhood of "Flying Post," on the Groundhog river. East of that red pine will be found, I believe, in greater or less quantity at intervals, all the way to our eastern boundary, and probably there may be also a smaller proportion of white pine; but no exploration has been made and almost nothing is known of the country between the Mattagami and Abittibi rivers. Banksian pine is found in many parts of this plateau and attains a good size, but it is not as yet in demand for any purpose that I know of, although it must become of use and consequently valuable in the near future.

In all parts of this plateau, spruce, tamarac and cedar grow well, and are found of good size, especially on the river bottoms. In the southern part of the plateau, and in favourable situations fine white spruce are found growing. The other principal forest trees are aspen, poplar, balsam and white or canoe birch; all of which attain a good size. With the exception of spruce, aspen is more plentiful on this plateau, than any other wood.

A market for most of the kinds of timber above numerated will ultimately be found in the United States. But until opened up by railways, this section of the country is completely cut off from that market, or indeed, any other; in the meantime it is of little value. When rendered accessible by rail, however, the forests on this plateau, and on the Height of Land plateau also will ultimately, I am thoroughly persuaded, prove very valuable to the Province; for however inferior the timber may be, both in respect of kind, size or quality, to that grown elsewhere, the time is inevitably approaching when the finer descriptions and better qualities of pine and other woods will be exhausted, and the teeming millions in the south will be eager to obtain such timber as we find in this territory, not inexhaustable but in very large quantity. Nor have I any doubt that if some attention were given to selection, thinning, drainage and the prevention of bush fires, even if the planting more valuable trees were omitted, the quantity of marketable timber, as well as the size and quality, might be greatly increased.

In corroboration of my prediction in reference to the probable future importance and value of the timber in this territory, when pine becomes scarce, I shall give a short extract from Mr. Alex. J. Russell's work "On the Hudson Bay and North-West Territories." Speaking of the sources from which the future inhabitants of the prairies in the North-West may obtain a supply of this indispensable commodity, pp. 88 and 89, Mr. Russell (who was formerly Assistant Commissioner of Crown Lands for this Province, and



thoroughly competent to speak on the subject both of land and timber) states as follows : "In prairie lands, the abundant supply of timber which entirely wooded countries afford, does not exist, and in the absence of pine, poplar and spruce have to be used for building purposes. They are both inferior to pine in value, but in a great part of Lower Canada spruce only is to be had, and much of it is exported as sawn lumber to Europe. *Poplar is undervalued through prejudice in a great degree. Of all the deciduous trees it is one of the best suited to take the place of pine in flooring and finishing houses, and for building the walls of dwellings it is very durable.* I have seen a house built of poplar that stood upwards of a hundred years, perfectly sound to the foundation when cut open. It may not accord with present ideas to say so, but before the pine of the Ottawa becomes exhausted, our extensive forests of poplar will be valued for lumbering purposes and brought into use.

"In our interior territories spruce timber, on account of its lightness, its straightness, and its strength, will take the place of pine for engineering purposes; and birch, on account of the fineness of its grain and its strength, will be serviceable for furniture and fine wood-work, especially in the northern regions where oak and maple are not to be found.

"The timber of the interior is of a smaller growth than with us, probably owing to the great dryness of the summer and cold in the winter; it is therefore probably stronger and perhaps more durable. In these respects woods of the same kind differ much with the soil and climate. The oak of the Ottawa averages only half the size of that of the western parts of Upper Canada, but it is superior to it in strength, and the timber which grows in parts of Canada near the sea is more durable than timber of the same kind of the interior. In bridge building I have found it to last nearly twice as long. . . . Great size gives squared timber an increased value in European markets, but the small dimensions into which our large Ottawa timber is invariably cut, in preparing sawn lumber for home use and exportation, *shows that great size is of no importance generally for home use*, excepting for the greater quantity it gives.

"White spruce is harder to saw and work up than pine, and with us it is less durable when exposed, but it is stronger, and its length and straightness make it very suitable for building timbers."

It is eighteen years since the work from which the foregoing extract is taken was written. The progress of events during that time goes to confirm the opinions so ably stated by Mr. Russell, and so fully concurred in by myself. Pine lands or timber limits which would have been regarded as almost if not entirely worthless thirty or forty years ago owing to remoteness from markets, inaccessibility, or inferiority of size and quality, are now eagerly sought for, and when offered for sale excite keen competition bringing prices that would have been thought fabulous in those days. Other woods are being used as substitutes for an increasing number of purposes where pine is becoming scarce and consequently high in price. There is a constantly increasing demand for timber, not only for building and old time engineering operations, but for purposes almost unthought of when I was born. The demand for railway ties, telegraph and telephone poles, for paper-making, for block pavements and many other purposes, large as the consumption now is it has sprung up entirely within the last three-score years. In view of an increase in the population of this continent alone reaching probably into hundreds of millions, no intelligent man who studies the question can fail to see that there must surely be a corresponding increase in the consumption of timber for all the purposes to which it is now applied; for if it be superseded by iron or other material for some of these, other uses will undoubtedly be found for it which will far more than compensate for the substitution of other material.

#### MINERALS.

The circumstance that I have in the course of my explorations in this central plateau, discovered few minerals of such kinds and none in such quantity of much, if any, economic value—is no proof whatever that they may not exist. Even if the metallic veins were both numerous and rich, the proportion of bare rock exposed to view is so exceedingly small that it could only be by the most diligent and protracted search, or by

the merest chance, that any of them would be found. In my opinion, however, this rock (mostly gneiss) does not contain many large or well-developed and regular veins. Nor are such veins as do occur, often charged with valuable minerals or metals, or if so, it is in quantities too small to admit of their being profitably worked. We found copper ore in one or two places, and also iron sand (magnetic) but the quantity was inconsiderable. At another point mica was seen of good quality and afforded sheets two or three inches square. But nothing else of any apparent value did we meet with in the tract explored this season.

In the course of my explorations in this territory, I have not met with a single instance where the Silurian and Devonian strata would appear to have been much, if at all dislocated, or even disturbed by volcanic or other agency, either on the Moose or Albany rivers or their tributaries.

So far as my own observations and experience go, the existence of large, regular and well-defined veins is intimately associated with, if not, actually dependent upon such disturbances or dislocations of the inclosing strata, commonly called the country rock. Then the state or condition of this "country rock," even when geologically favourable, would appear to exercise more or less influence on the mineral contents of the veins. I am most hopeful when this rock is more or less decomposed, "or rotten," at least at or near the surface, conveying the impression of age and long continued chemical action, and change of structure if not of composition.

There may be, and generally are, marked differences between veins in the same mining field or district, and even those in close proximity to each other. They differ in their general bearing or course, in their size, dip or inclination. The matrix or veinstone, the ores or metallic contents and the accompanying spars and "soils" may not be the same. They may be close, hard, compact and dry, or as miners say "hungry-looking," or so open and porous as to allow of the free circulation of water with the mineral contents, spars, gossan and ores in such a loose condition, as frequently to allow no inconsiderable part of the work of mining or excavation to be performed with the pick and shovel alone. The practical miner is guided in his judgements, by the knowledge and experience he has gained in the mining fields or districts with which he is acquainted, and directs his labours accordingly.

Now, although it may be thought by some uncalled for or imprudent, I feel it my duty to state for the information and guidance at all events of the Government, my opinion frankly in reference to this territory, seeking neither unduly to exaggerate and extol the importance and value of its resources on the one hand, nor depreciate them on the other. This opinion is, that to whatever cause or combination of causes it may be owing, there are seemingly few true mineral veins or lodes of large size and running for any considerable distance or length in this territory, and that those small or irregular veins that do occur, are generally hard, compact and dry, and if not entirely destitute of minerals or metallic ores of economic value, contain them in quantities too small to defray the expense of their extraction.

This scarcity of true mineral veins in most parts of the territory (even of veins that are barren), is the more remarkable, in as much as the Laurentian and Huronian rocks are traversed by numerous and exceedingly large trap dykes, which, with the exception of their composition of contents, differ little, if at all from mineral veins, and the existence of which would seem to indicate more or less volcanic disturbance. This disturbance must have occurred, it seems to me, *before* the deposition of the stratified rocks of the Paleozoic Age, for only in one instance (and that somewhat doubtful) have I found a trap dyke which appeared to cut through or intersect these strata.

By far the most promising and desirable portion of this disputed territory, in regard to its mineral resources, in my opinion, is a belt commencing a little above and extending thirty miles or so below the long portages on the Abitibi, Mattagami and Missinabie branches of Moose river.

It is in this belt, at or near the edge or outcrop of the Devonian and Silurian strata, where we chiefly find iron ore, lignite coal, china clay, ochres and sands of more or less economic importance and value.

If the northern boundary of the Province had been determined satisfactorily, I



should have suggested the desirability of ascertaining, by boring or otherwise, the quality and extent of the beds of lignite in this territory ; but under the circumstances, however desirable and important, I have felt that it would be useless to do so.

Even where private enterprise might have been enlisted in the work of developing the mineral resources of the country, nothing can be done owing to the impossibility of obtaining such titles as would justify capitalists in the expenditure that would be necessary.

And for the like reason, anything of the nature of exploration by private individuals in this disputed territory would be a mere waste of time and labour and money, and is therefore utterly discouraged.

#### INDIANS.

In my last report I stated that the Indians of the Brunswick Lake Band, who now for the most part trade at the Hon. Hudson's Bay Company's post at Missinabie, were exceedingly anxious that a treaty should be made with them. I pointed out that the line of the Canadian Pacific Railway had been located, and runs for a considerable distance through their hunting-grounds ; that treaties had been made years ago with every other band of Indians similarly situated, and that it was only right a treaty should be made with them. That the claims of these Indians and those at Flying Post and Mattawagaminque in the Kinogamissie district, had been overlooked, or entirely and unaccountably neglected by the Indian Department at Ottawa, was also represented. Nothing, however, has been done, so far as I am aware, up to the present time.

In view of the recent sad case in which an unfortunate young man was shot near White River Station, of the C. P. R., in an altercation with Indians about furs, I would beg respectfully to offer the following remarks and suggestions which, if adopted and carried out by and with the proper authority, would, I believe, greatly diminish the number, if not altogether prevent such deplorable occurrences in future.

For generations the Hudson's Bay Company's officers have been in the habit of making advances to the Indian hunters and trappers in their territories during the summer and autumn, on the understanding, of course, that the amount thus advanced is to be repaid out of the proceeds of the following winter's hunt. This is called "their outfit," and the value of the articles thus obtained may be, and frequently is, from one hundred to two hundred dollars, if not more, each family. So general has this custom been, and so long has it prevailed, that the Indians rely with full and implicit confidence upon its maintenance. Should the Company be obliged to change their policy, and without intimation or warning put an end to this "old custom," it would be a very serious thing indeed for the Indians of this territory. It would entail not only a great deal of suffering, but in all probability, a great many deaths.

It is to be hoped, therefore, that wherever, and whenever the Hon. Hudson's Bay Company may find it necessary to discontinue this practice of making advances (as they must ultimately) that it may be done as gradually as possible.

The construction of railways and progress of settlement is bringing other fur traders into this northern territory, and unless the trade with the Indians be guarded or regulated in some way or other, not only will the Company be obliged to cease making the usual advances, with the results above pointed out, but other evils will undoubtedly follow. The men who are thus brought into the country and tempted to engage in the fur-trade in opposition to the Hudson's Bay Company, are not unfrequently possessed of little means and less principle. Sometimes they are neither Canadians nor British subjects ; they have no fixed abodes nor places of business ; in fact, they are too often neither respectable nor responsible, but men of the viler sort. Such men stick at nothing with their dealings with the Indians. They visit their camps on their hunting grounds by means of snow-shoes in the winter, and way-lay them in canoes when coming to the Company's posts with their furs in the spring. As regards "the goods" which such men take along with them to barter or trade with the Indians for furs, they consist largely of whiskey and trinkets, sometimes whiskey straight, or alone ; if other articles of a bulkier or heavier description be employed they are probably adulterated, or of the poorest quality. Men of this stamp should not (if it can be avoided) be allowed to gain foothold in this

territory, or under any pretext to engage in trade with the Indians, for trade so conducted can only result in violence, bloodshed, and the general demoralization of the natives.

Even respectable men (comparitively) who have established little stores on the line of the C. P. R. with the view to trading, chiefly with the employees of the Company, cannot resist the temptation to engage in the fur-trade, and in prosecution of it, to exceed that which is lawful and right.

Not contented with simply buying those furs which the Indians bring to them, they must become "peddlers," and on snow-shoes or with dog-trains visit the Indians on their hunting grounds during the winter. The camps of the Indians thus visited may be several days' journey from these men's places of business. After the toil of such a journey they are unwilling, we may be sure, to return empty-handed. They may know that these Indians have received their outfit from the Hudson's Bay Company, and that the Company have, morally speaking, a "lien" on the furs they have caught; but that consideration is as the small dust in balance as against avarice, and if they can persuade them to be so dishonest they will buy every single skin they have got. Or it sometimes happens the trader himself may have made some little advance to the Indian, and demands furs in payment thereof. If content with what the Indian thinks right to give him it is well, but if he insists upon having more, or in taking furs which the family are reserving for the Hudson's Bay Company, there is likely to be trouble in the camp, and somebody hurt, if not killed. It is no uncommon thing for such traders, or their employees and assistants, to bully and intimidate the Indians into parting with their furs, or even take them by force if they are in a position to do so, and that more especially if the Indian is the least in his debt. Blows once struck the Indians are afraid that they are not only going to be robbed, but murdered, and make use of such weapons to defend themselves and their property as may be at hand. It was in a quarrel (thus brought about as I have been told) that the young man alluded to lost his life near White river.

Now, what I would recommend is this: that all parties desiring to trade with the Indians in unorganized territory, should be obliged to procure from the proper authority "a license" permitting him so to do. No license should be issued to men of bad or doubtful character. The license should be subject to certain conditions, a breach of which should entail penalties or a revocation of the license, or both. Those trading with Indians in such unorganized territory as our Northern Territory, should be amenable, on conviction, to forfeiture of furs and other goods found in their possession, or other severe penalties.

Another suggestion I desire to make is in regard to the fur-bearing animals, namely: Until treaties are made with the several bands of Indians under which they surrender wholly or partially their rights, no hunters, whether white men or Indians of other bands, should be permitted to trap or otherwise take the fur-bearing animals on the hunting grounds of these non-treaty Indians, or if convicted of doing so without the consent of the band, should be liable to penalties at least as severe as those imposed upon "poachers" in the Mother Country. Indeed, they should be much more severely dealt with in some cases. Many of the Indians have little lakes or ponds on their hunting grounds, wherein one or more pair of beaver build their lodges and rear their young. Some of these Indians are prudent enough to refrain from killing all these animals during the winter, knowing the vital importance of leaving a sufficient number to breed. Frequently they do not take or kill any of them until the month of March, when the fur is at its best, and the food, which the creature's flesh supplies, is most needed. When white men, trespassing on the hunting grounds of such Indians, find these "beaver preserves" (for they are virtually such) they trap or otherwise catch all they can; they break into the lodges, they tear down the dams, and let off the water, and do not (if they can help it) leave as much as a single beaver, male or female, young or old. In so doing (and I have heard of such cases on good authority) these trappers from the outside commit an offence (morally at least) much more heinous than that of "poaching"; they rob the wretched owner of the furs and the food sometimes indispensably necessary for the support of his family. And in addition to that they ruin his prospects of obtaining any more at that place or spot for years to come, if not for ever. The Indians should be protected as far as possible against such wrongs—wronges which partake more of the nature of sheep-stealing than of poaching.



I look upon the beaver as being of so much importance to the Indians of the North-West that I think, even when their claims to almost everything else have been surrendered, that the ownership of at least some of the little lakes and ponds on their hunting grounds, in which beaver are in the habit of breeding, should be reserved to them, and they should be encouraged to take care of and breed these interesting and valuable animals, if not to domesticate them. See Report for 1884-5, page 27, *et seq.*, for my views on this subject.

ADMINISTRATION OF JUSTICE.

No crimes or serious offences have been committed or, if committed, reported to me during the past year. It is only of such offences which, under the circumstances, I should consider it prudent or even in the interest of the inhabitants of the District, to take cognizance. Necessary as it undoubtedly is to punish wrong-doers and criminals, it is quite as important and much more sensible to prevent, as far as possible, wrong-doing and crime by wise and timely precautions.

Holding these views, I have regarded it as one of my chief duties to make myself acquainted with the exceptional social condition and the peculiar wants of the people of this territory, in order that I might be in a better position to advise the Government and to offer more or less valuable suggestions, having chiefly for their object the prevention of crime and the welfare of the people at large.

Respectfully submitted,

E. B. BORRON,

Stipendiary Magistrate.



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# DETAILED REPORT

OF THE

# INSPECTOR OF INSURANCE,

1887.

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Printed by Order of the Legislative Assembly.

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Toronto:

PRINTED BY WARWICK & SONS, 26 AND 28 FRONT STREET WEST.

1887.



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DETAILED REPORT

OF THE

INSPECTOR OF INSURANCE,

FOR THE

YEAR ENDING 31ST DECEMBER, 1886.

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*The Honourable A. McL. Ross, M.P.P.,  
Provincial Treasurer, Toronto.*

SIR,—Having previously submitted, in printed form, an Abstract Report of Insurance Companies' Statements for the year ending 31st December, 1886, I have now the honour to submit the Detailed Report as provided by the Ontario Insurance Act, 1887.

This Report includes :—

I. Detailed Statements and Synoptical Tables of Joint Stock Fire Insurance Companies.

II. Detailed Statements and Synoptical Tables of Cash-Mutual Fire Insurance Companies.

III. Detailed Statements and Synoptical Tables of Strictly Mutual Fire Insurance Companies.

IV. Comparative Summary of Assets and Premium Notes of Mutual Companies of all Classes.

V. Fire Tables for 1886 ; showing

(a) Localities, Months of Occurrence, and Total Claims paid ;

(b) Localities, Causes and number of Losses ; and

VI. Register of Insurance Companies brought up to 30th September, 1887.

I have the honour to be,

Sir,

Your obedient servant,

• J. HOWARD HUNTER,

*Inspector.*



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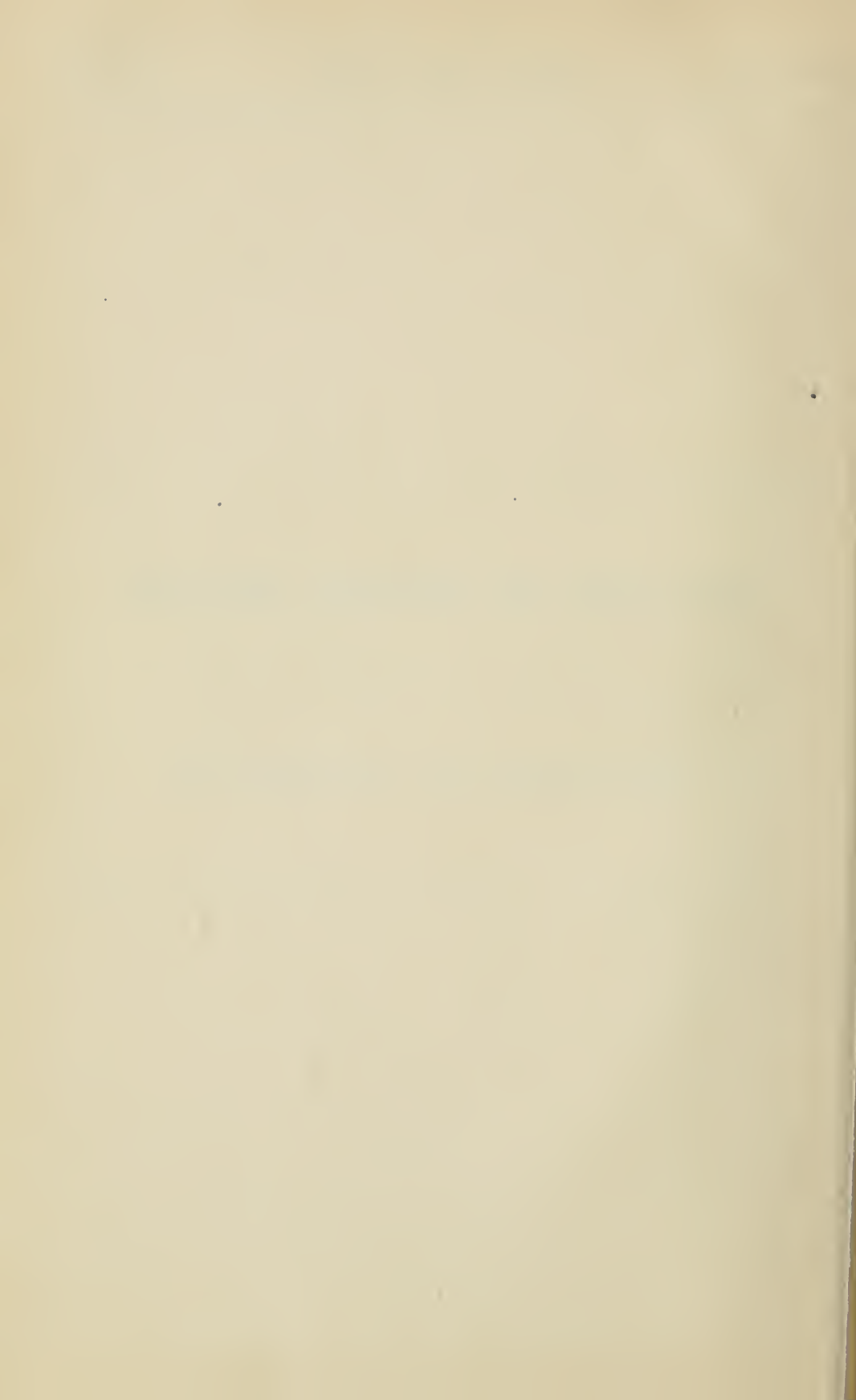
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JOINT STOCK FIRE INSURANCE COMPANIES.

YEAR ENDING 31<sup>ST</sup> DECEMBER, 1886.

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## JOINT STOCK FIRE INSURANCE COMPANIES.

YEAR ENDING 31st DECEMBER, 1886.

[FOR HAND-IN-HAND INSURANCE COMPANY (MUTUAL AND STOCK);  
AND MILLERS' AND MANUFACTURERS' INSURANCE COMPANY,  
(STOCK AND MUTUAL);

*See under "CASH MUTUAL COMPANIES."]*

## MERCANTILE FIRE INSURANCE COMPANY.

HEAD OFFICE, WATERLOO.

*Commenced business 1st November, 1875.**President*—I. E. BOWMAN, M.P.*Secretary*—P. H. SIMS.

Authorized Capital, \$500,000.

Subscribed Capital, \$200,000. Paid up, \$20,000.

Deposited with Treasurer of Ontario, \$20,100, par value.

Statement for the year ending 31st December, 1886.

## ASSETS.

*Mortgages.*

Location of Property Covered.	Cash Value. of Property.	Amount of Mortgages.	
Wellington County . . . . .	\$33,700 00	\$14,950 00	
Waterloo " . . . . .	74,620 00	31,160 00	
Bruce " . . . . .	14,100 00	8,100 00	
	<u>\$122,520 00</u>		\$54,210 00
Market value of stocks . . . . .			1,120 00
" debentures . . . . .			11,950 00
Interest due, accrued and unpaid . . . . .			2,261 85
Cash on hand in head office . . . . .	\$4,063 07		
Cash deposited at Molson's Bank, Waterloo . . . . .	4,962 67		
			<u>9,025 74</u>
Agents' balances . . . . .			4,874 94
Bills receivable, less than one year overdue . . . . .			1,951 47
Total assets . . . . .			<u>\$85,394 00</u>

## LIABILITIES.

Amount of claims for losses adjusted but not due .....	\$4,714 90
Unearned premiums, being 50 per cent. of gross premiums .....	52,806 30
Dividends declared, but not yet due .....	1,600 00
Total liabilities, except capital stock .....	<u>\$59,121 20</u>
Capital stock paid up in cash .....	<u>\$20,000 00</u>

## INCOME.

Gross premiums received in cash .....	\$94,975 13
Received for interest from all sources .....	3,434 36
“      carpenters' risks, transfer fees, and extra premiums .....	784 62
“      reinsurance .....	4,379 36
Total income .....	<u>\$103,573 47</u>

## EXPENDITURE.

Net amount paid during the year for losses occurring in years prior to 1886 .....	\$976 63
Amount paid for losses occurring during the year 1886 .....	64,593 52
	<u>\$65,570 15</u>
Amount paid for reinsurance premiums .....	4,963 09
“      dividends .....	2,000 00
“      refund and cancelled premiums .....	6,219 22

*Expense Account :*

Commission and brokerage .....	\$15,196 37
Salaries, fees, and all other charges of officials for the year .....	4,472 20
Travelling expenses and adjusting losses .....	1,339 60
Fuel, light, and cleaning .....	14 51
Printing and advertising .....	795 57
Express charges .....	56 17
License fee and statutory assessment .....	262 28
Rent .....	358 44
Commercial agency .....	50 00
Books and stationery .....	386 64
Bank exchange .....	141 99
Postage and telegraphing .....	1,015 44
Solicitor's charges and law costs .....	315 35
Taxes .....	22 65
Canadian Fire Underwriters' Association .....	195 65
Sundries .....	56 80
	<u>24,679 66</u>
Total expenditure .....	<u>\$103,432 12</u>

## RISKS.

	No. of Policies.	Amount.
		\$ c.
Policies in force December 31st, 1885.....	7,162	7,271,255 00
Taken during the year 1886—new and renewed .....	6,389	6,579,238 00
Total .....	13,551	13,850,493 00
Deduct expired and cancelled during 1886 .....	5,251	5,717,754 00
In force at December 31st, 1886 .....	8,300	8,132,739 00
Of which was reinsured.....		237,744 00
Net risks carried by Company, December 31st, 1886 .....		7,894,995 00

## LIST OF STOCKHOLDERS.

NAME.	Residence.	Amount Subscribed.	Amount paid up in cash.
		\$ c.	\$ c.
Allenby, F. G.....	Galt .....	4,000 00	400 00
Bowman, J. E.....	Waterloo .....	12,000 00	1,200 00
Bowers, Cyrus.....	Berlin .....	5,000 00	500 00
Bowman, I. D.....	" .....	1,000 00	100 00
Bricker, Jacob.....	Waterloo .....	2,000 00	200 00
Ballantyne, Thomas .....	Stratford .....	1,000 00	100 00
Bowlby, D. S., M.D.....	Berlin .....	10,000 00	1,000 00
Boye, Ernest.....	Baden .....	1,000 00	100 00
Biscoe, Frederick .....	Guelph .....	1,000 00	100 00
Bellinger, Theo.....	Waterloo .....	500 00	50 00
Bowman, J. S.....	Arthur .....	500 00	50 00
Briethaupt, L.....	Berlin .....	1,200 00	120 00
Colquhoun, F. ....	Waterloo .....	3,500 00	350 00
Colquhoun, I. Ledellia.....	" .....	2,000 00	200 00
Cameron, Wm.....	Port Elgin .....	500 00	50 00
Caw, Wm., M.D.....	Parkhill .....	1,000 00	100 00
Day, T. J.....	Guelph .....	1,000 00	100 00
Doering, John E.....	Wellesley.....	500 00	50 00
Dickson, Wm.....	Parkhill .....	500 00	50 00
Erb, E.....	Preston .....	1,000 00	100 00
Eccles, Daniel.....	Watford .....	500 00	50 00
Farrish, Wm.....	Rockwood .....	1,000 00	100 00
Fennell, John.....	Berlin .....	500 00	50 00
Fletcher, Ann, Mrs. ..	Rockwood .....	3,200 00	320 00
Fink, Paul.....	Waterloo .....	1,000 00	100 00
Gibbs, John.....	Parkhill .....	2,000 00	200 00
Gissing, F. J. ....	Ontario, California.....	1,000 00	100 00
Hughes, J. B.....	Waterloo .....	2,000 00	200 00
Hilliard, Thomas .....	" .....	1,000 00	100 00
Hendry, Charles .....	" .....	5,000 00	500 00
Hunter, Wm.....	Guelph .....	2,000 00	200 00
Hay, W. G.....	Listowel .....	1,000 00	100 00
Hough, James.....	Guelph .....	1,000 00	100 00
Hogg, David N.....	" .....	2,500 00	250 00

LIST OF STOCKHOLDERS—*Continued.*

NAME.	Residence.	Amount Subscribed.	Amount paid up in cash.
		\$ c.	\$ c.
Innes, James .....	Guelph .....	2,000 00	200 00
Irwin, John .....	Strathroy .....	1,000 00	100 00
Jackson, Henry F. J. ....	Brockville .....	5,000 00	500 00
Jaffray, R. ....	Galt .....	1,000 00	100 00
Killer, Nicholas .....	Waterloo .....	1,000 00	100 00
Kaufman, S. ....	Washington, Ont. ....	5,000 00	500 00
Kumpf, C. ....	Waterloo .....	1,000 00	100 00
Kranz, Hugo .....	Berlin .....	1,000 00	100 00
Livingston, James .....	Baden .....	2,000 00	200 00
Lockie, James .....	Waterloo .....	2,500 00	250 00
Lautenschlager, P. ....	Berlin .....	2,000 00	200 00
Moore, George .....	Waterloo .....	3,000 00	300 00
Miller, Alex. ....	Berlin .....	1,000 00	100 00
Melvin, Robert .....	Guelph .....	7,000 00	700 00
Massie, James .....	Toronto .....	2,000 00	200 00
Merner, Fred. ....	New Hamburg .....	1,000 00	100 00
Morton, W., M.D. ....	Wellesley .....	500 00	50 00
Oelschlager, Wm. ....	Berlin .....	5,000 00	500 00
Peffers, Joseph .....	Listowel .....	500 00	50 00
Petrie, A. B. ....	Guelph .....	3,000 00	300 00
Reiner, John G. ....	Wellesley .....	2,000 00	200 00
Somerville, G. A. ....	Guelph .....	2,500 00	250 00
Snyder, J. B. ....	St. Jacob's .....	10,000 00	1,000 00
Snider, E. W. B. ....	" .....	6,000 00	600 00
Shuh, John .....	Waterloo .....	2,000 00	200 00
Snider, John B. ....	" .....	2,000 00	200 00
Snider, Simon .....	" .....	5,000 00	500 00
Sims, P. H. ....	" .....	3,000 00	300 00
Snider, Wm. ....	" .....	2,500 00	250 00
Stewart, Wm. ....	Guelph .....	1,000 00	100 00
Scott, John A. ....	Stratford .....	1,000 00	100 00
Staebler, J. M. ....	Berlin .....	1,000 00	100 00
Schneider, Fred .....	" .....	1,000 00	100 00
Stuebing, Wm. ....	Waterloo .....	500 00	50 00
Sawtell, R. W. ....	Woodstock .....	1,000 00	100 00
Scott, J. W. ....	Listowel .....	1,000 00	100 00
Shields, James .....	Lead City, Dakota Territory. ....	1,000 00	100 00
Scoon, John .....	Guelph .....	500 00	50 00
Springer, M. ....	Waterloo .....	1,500 00	150 00
Stirton, David .....	Guelph .....	3,000 00	300 00
Trow, James .....	Stratford .....	5,000 00	500 00
Towner, George .....	Listowel .....	1,000 00	100 00
Winger, Peter .....	Elmira .....	1,000 00	100 00
Wilkes, Alfred J. ....	Brantford .....	2,000 00	200 00
Wright, G. W., M.D. ....	Berlin .....	1,000 00	100 00
Wright & Durand .....	London .....	500 00	50 00
Webb, J. H., M.D. ....	Waterloo .....	4,000 00	400 00
Young, Wm. ....	Waterloo .....	17,600 00	1,760 00
Zoegeer, John .....	Newton .....	500 00	50 00
Zinkann, J. N. ....	Lisbon .....	500 00	50 00
Total .....		\$200,000 00	\$20,000 00

# QUEEN CITY FIRE INSURANCE COMPANY.

HEAD OFFICE, TORONTO.

*Commenced business 1st July, 1871.*

*President*—W. H. HOWLAND.

*Secretary*—THOMAS WALMSLEY.

Authorized Capital, \$100,000.

Subscribed Capital, \$100,000.      Paid up, \$50,000.

Securities deposited with Treasurer of Ontario, \$10,000, par value.

## ASSETS.

Value of real estate held by Company, being land and building on the west side of Church Street, Toronto, where the head offices of the Company are situated..... \$61,000 00

### Mortgages :—

	Cash value of property.	Amount of Mortgages.
Scarboro' Township..	\$8,900 00	\$4,500 00
Toronto City.....	200,196 00	47,321 12

\$209,096 00

Total amount of loans secured by mortgage ..... \$51,821 12

Stocks.	Par value.	Market value.
Federal Bank .....	\$3,000 00	\$3,165 00
Imperial Bank .....	900 00	1,370 00
Dominion Bank ....	5,500 00	12,086 25

\$9,400 00

\$16,621 25

Deposited with the Dominion Bank, Toronto..... 1,026 82

Agents' balances ..... 1,478 33

Interest accrued and unpaid on all loans as above..... 2,149 64

Accrued rents ..... 3,512 51

Total assets..... \$137,609 67

## LIABILITIES.

Unpaid losses ..... \$ 31 00

Unearned premiums, being 50 per cent. of gross premiums.... 9,212 19

Other liabilities..... 411 20

Total liabilities, except capital stock..... \$9,654 39

Capital stock paid up in cash..... \$50,000 00



## REVENUE ACCOUNT.

Gross premiums received in cash .....	\$14,033 14
Received for interest and dividends on stocks and all other sources .....	4,252 59
Rents .....	2,637 65
Total .....	<u>\$20,923 38</u>

## EXPENDITURE.

Amount paid during the year for losses occurring in years prior to the year 1886 .....	\$2 50	
Amount paid for losses occurring during the year 1886 .....	1,686 07	
“ re-insurance premiums .....		\$1,688 57
Amount of dividends paid during the year .....		1,561 50
Paid for commission, or brokerage .....	\$1,257 37	2,500 00
“ salaries, fees, and all other remuneration of officials ..	4,595 00	
“ rent .....	500 00	
“ statutory assessment and license fee .....	117 01	
“ books and stationery .....	36 23	
“ printing and advertising .....	66 15	
“ revising plans .....	14 00	
“ assessment Board of Underwriters .....	25 00	
“ telephone .....	25 00	
“ sundries .....	22 15	
		<u>6,657 91</u>
Total expenditure .....		\$12,407 98

## MISCELLANEOUS.

FIRE RISKS.	Number.	Amount.
		\$ c.
Policies in force (gross) December 31st, 1885 .....	1,476	2,175,444
Taken during the year 1886, new and renewed .....	1,222	1,671,288
Total .....	2,698	3,846,732
Deduct expired and cancelled during 1886 .....	1,233	1,464,466
In force at 31st December, 1886 .....	1,465	2,382,266
Of which was re-insured .....		437,844
Net risks carried by Company December 31st, 1886 .....		\$1,944,422

## LIST OF STOCKHOLDERS.

NAME.	Residence.	Amount sub- scribed.	Amount paid up in cash.
		\$ c.	\$ c.
Austin, James.....	Toronto .....	2,000 00	1,000 00
Badenach, William .....	" .....	1,000 00	500 00
Close, P. G .....	" .....	1,000 00	500 00
Copp, Clark & Co .....	" .....	1,000 00	500 00
Downey, J .....	" .....	1,000 00	500 00
Elliott, R. W .....	" .....	2,500 00	1,250 00
English, C. E .....	" .....	12,500 00	6,250 00
Harvey, A .....	" .....	500 00	250 00
Hessin, William .....	" .....	500 00	250 00
Howland, O. A. (in trust) .....	" .....	4,000 00	2,000 00
Howland, W. H .....	" .....	10,000 00	5,000 00
MacLennan, James.....	" .....	5,000 00	2,500 00
MacLennan, James } Walmsley, Thomas } Trustees .....	" .....	5,000 00	2,500 00
Howland, W. H. }			
Macnab, John.....	" .....	3,000 00	1,500 00
McWilliams, W. G .....	" .....	500 00	250 00
Roaf, J. R .....	" .....	1,500 00	750 00
Scott & Walmsley.....	" .....	25,500 00	12,750 00
Scott, Hugh.....	" .....	5,000 00	2,500 00
Scott, James .....	" .....	3,000 00	1,500 00
Scott, J. G .....	" .....	1,000 00	500 00
Strathy, H. H.....	Barrie.....	1,000 00	500 00
Walmsley, William.....	Toronto .....	1,000 00	500 00
Walmsley, Thomas .....	" .....	10,000 00	5,000 00
Watson, James.....	" .....	1,000 00	500 00
Wood, A. T.....	Hamilton .....	1,500 00	750 00
Total .....	.....	100,000 00	50,000 00





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# RECAPITULATION

OF

ASSETS, LIABILITIES, INCOME AND EXPENDITURE

OF ALL JOINT STOCK FIRE INSURANCE COMPANIES.

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## JOINT STOCK FIRE INSURANCE COMPANIES.

ASSETS FOR YEAR ENDING 31st DECEMBER, 1886.

NAME OF COMPANY.	Real Estate.	Bonds, Mortgages and other Investments.	Interest accrued.	Rents.	Cash.	Agents' Balances.	Bills Receivable.	Other Assets.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
* Mercantile .....	.....	67,280 00	2,261 85	.....	9,025 74	4,874 94	1,951 47	.....	85,394 00
* Queen City .....	61,000 00	68,442 37	2,149 64	3,512 51	1,026 82	1,478 33	.....	.....	137,609 67
Total .....	61,000 00	135,722 37	4,411 49	3,512 51	10,052 56	6,353 27	1,951 47	.....	223,003 67

\* Government Deposits as follows:—Mercantile, \$20,100; Queen City, \$10,000, par value.

## LIABILITIES FOR YEAR ENDING 31st DECEMBER, 1886.

NAME OF COMPANY.	Unpaid Losses.	Unearned Premiums calculated at 50 per cent.	Sundries.	Total Liabilities except Capital Stock.	Paid-up Capital Stock.	Grand Total of Liabilities.	Number of Policies in force.	Total Amount at Risk.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.		\$ c.
Mercantile .....	4,714 90	52,806 30	1,600 00	59,121 20	20,000 00	79,121 20	8,300	8,132,739 00
Queen City .....	31 00	9,212 19	411 20	9,654 39	50,000 00	59,654 39	1,465	2,382,266 00
Total .....	4,745 90	62,018 49	2,011 20	68,775 59	70,000 00	138,775 59	9,765	10,515,005 00

## JOINT STOCK FIRE INSURANCE COMPANIES.

INCOME FOR YEAR ENDING 31ST DECEMBER, 1886.

12 (18.)

NAME OF COMPANY.	Gross Premiums.	Interest and Dividends.	Rents.	From other sources.	Total Income.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Mercantile .....	94,975 13	3,434 36	.....	5,163 98	103,573 47
Queen City .....	14,033 14	4,232 59	2,637 65	.....	20,923 38
Total .....	108,008 27	7,666 95	2,637 65	5,163 98	124,496 85

## EXPENDITURE FOR YEAR ENDING 31ST DECEMBER, 1886.

NAME OF COMPANY.	Dividends.	Losses.	Re-insurance.	Refunds, and Abatements.	EXPENSES OF MANAGEMENT.				Total Expenditure.
					Commission.	Salaries.	All other expenses.	Total.	
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Mercantile .....	2,000 00	65,570 15	4,963 09	6,219 22	15,196 37	4,472 20	5,011 09	24,679 66	103,432 12
Queen City .....	2,500 00	1,688 57	1,561 50	.....	1,257 37	4,345 00	805 54	6,457 91	12,407 98
Total .....	4,500 00	67,258 72	6,524 59	6,219 22	16,453 74	9,067 20	5,816 63	31,337 57	115,840 10

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CASH MUTUAL COMPANIES.

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YEAR ENDING 31<sup>ST</sup> DECEMBER, 1886.

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## MIXED MUTUAL AND CASH SYSTEM COMPANIES.

YEAR ENDING 31<sup>ST</sup> DECEMBER, 1886.

## THE CITY MUTUAL OF LONDON FIRE INSURANCE COMPANY.

HEAD OFFICE, LONDON.

*Commenced business 1st June, 1886.**President*—JAMES COWAN.*Secretary*—HUGH VALLANCE.

Unassessed premium note capital, \$12,180.51.

Cash deposited in Federal Bank to credit of Provincial Treasurer in trust for City Mutual  
Fire Insurance Company, \$6,000.00.

## ASSETS.

Cash on hand at head office .....	\$1 54	
Cash on deposit to the Company's credit not drawn against in Federal Bank .. .. .	1,101 06	
Cash deposit to credit of Provincial Treasurer, in Federal Bank, as above .....	6,000 00	
		\$7,102 60
Cash in agents' hands acknowledged by them to be due, and considered good .....		947 05
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	\$12,180 51	
Less residue of premium notes given for reinsurance .....	913 60	
		11,266 91
Bills receivable .....		50 00
Total assets .....		<u>\$19,366 56</u>

## LIABILITIES.

Amount of unpaid loan .....	\$5,000 00
Unearned premiums, being 50 per cent. of gross premiums .....	1,070 55
Total liabilities .....	<u>\$6,070 55</u>

## RECEIPTS.

Cash received as first payments, being part payments of premium notes ..	\$2,414 91
Cash received for premiums on cash system .....	1,797 38
“ for interest .....	1 22
“ money borrowed .....	5,000 00
“ transfer fees and extra premiums .....	2 50
Total receipts .....	<u>\$9,216 01</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid to agents for commission.....	\$787 60
“ statutory assessment or certificate .....	20 00
“ investigation and adjustment of claims.....	10 45
“ printing, stationery and advertising .....	356 21
“ salaries, directors' and auditors' fees.....	135 00
“ postage, telegrams and express .....	34 20
“ travelling expenses .....	129 65
“ sundries.....	15 73
Expenses of management .....	<u>\$1,488 84</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886.....	349 24
“ reinsurance .....	208 07
“ rebate, abatement and returned premiums.....	47 86
“ office furniture .....	19 40
Total expenditure .....	<u>\$2,113 41</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st Dec., 1886.*

SYSTEM.	Total.
	\$
Mutual.....	191,488 00
Cash .....	163,531 00
Total at risk.....	<u>355,019 00</u>

MOVEMENT IN RISKS.

Mutual System.

	Number.	Amount.
		\$
Policies in force 31st December, 1885.....		
“ new and renewed during 1886 .....	151	196,188 00
Gross number during 1886.....	151	196,188 00
Less expired and cancelled in 1886.....	5	4,700 00
Net risks in force 31st December, 1886 .....	146	191,488 00
Cash System.		
Policies in force 31st December, 1885.....		
“ taken during 1886, new and renewed .....	185	187,031 00
Gross number during 1886.....	185	187,031 00
Less expired and cancelled in 1886.....	22	23,500 00
Net risks in force on cash system 31st December, 1886 .....	163	163,531 00

CLASSIFICATION OF RISKS:

General Fire Insurance.

PREMIUM NOTES OR UNDERTAKINGS

On Policies in force 31st December, 1886.

	One year.	Two years.	Three years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Com- pany and legally liable to assessment .....	662 50	404 00	14,011 77	15,078 27
Amount of all premium notes, after deducting all payments thereon and assessments levied ....				12,180 51
Amount of premium notes received during the year 1886.....			15,462 27	15,462 27



## GORE DISTRICT MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, GALT.

*Commenced business 16th October, 1839.**President*—HON. JAMES YOUNG.*Secretary*—R. S. STRONG.

Unassessed premium note capital, \$137,089.31.

Securities deposited with Treasurer of Ontario, par value, \$20,000.

## ASSETS.

Loans secured by mortgages .....	\$49,425 00
Market value of shares, bonds, debentures and securities other than the foregoing .....	17,075 00
Actual cash on hand at head office.....	\$906 58
Cash on deposit to the Company's credit, not drawn against in the following chartered banks :	
Merchants' Bank, agency at Galt .....	16,267 42
Bank of Commerce           " .....	12,360 47
	29,534 47
Cash in agents' hands acknowledged by them to be due and considered good .....	3,214 05
Amount unpaid of assessments levied during 1886 .....	72 56
Amount unpaid of premium notes in force, after deducting all payments thereon and assessments levied.....	\$137,089 31
Less residue of premium notes given by the Company for re-insurance .....	2,577 47
	134,511 47
Net premium notes .....	134,511 47
Amount of interest accrued .....	1,690 69
Total assets .....	<u>\$235,523 24</u>

## LIABILITIES.

Amount of losses supposed or reported ..	\$3,060 00	
“ “ resisted .....	2,822 46	\$5,882 46
Amount required to re-insure all outstanding risks taken on the cash system, being 50 per cent. of gross premiums on all cash system policies in force at 31st December, 1886 .....		23,474 55
Total liabilities .....		<u>\$29,357 01</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$910 87	
Cash received as first payments and assessments .....		\$44,846 19
“ for premiums on cash system .....		32,944 71
“ for interest .....		4,415 17
“ from transfer fees .....	\$68 01	
“ for extra premiums, including workmen's risks ..	274 33	
“ for re-insurance claims .....	4,313 28	
		4,655 62
Total receipts .....		<u>\$86,861 69</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents .....	\$9,195 39	
“ law costs .....	33 00	
“ fuel and light .....	55 14	
“ investigation and adjustment of claims ..	292 71	
“ statutory assessment or certificate .....	215 29	
“ printing, stationery and advertising ....	1,025 72	
“ rent and taxes .....	517 50	
“ salaries, directors' and auditors' fees ....	6,466 00	
“ travelling expenses .....	575 20	
“ postage, telegrams and express .....	684 24	
Expenses of management .....		\$19,060 19

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	\$52,843 82	
“ “ “ prior to 1886 .....	100 00	\$52,943 82
“ re-insurance .....		6,459 17
“ rebate, abatements and returned premiums .....		1,460 91
“ bonus to agents .....		1,331 59
“ incidental .....		139 02
Total expenditure .....		<u>\$81,394 70</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Two years.	Three years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Mutual .....	9,000 00	1,800 00	2,536,812 19	2,547,612 19
Cash .....	1,248,871 20	.....	3,071,195 92	4,320,067 12
Total .....	1,257,871 20	1,800 00	5,608,008 11	6,867,679 31
<i>Re-insured.</i>				
Mutual .....	47,666 66	.....	.....	.....
Cash .....	316,466 68	.....	.....	.....
Total .....	364,133 34	.....	.....	364,133 34
Net risks carried by Company, Dec. 31st, 1886 .....	.....	.....	.....	6,503,545 97

## MOVEMENT IN RISKS.

	Number.	Amount.
<i>Mutual System.</i>		\$ c.
Policies in force 31st December, 1885 .....	1,612	2,184,888 01
Policies new and renewed during 1886 .....	767	1,112,338 00
Gross number during 1886 .....	2,379	3,297,226 01
Less expired and cancelled in 1886 .....	547	749,613 82
Net risks in force on mutual system, 31st December, 1886 .....	1,832	2,547,612 19
<i>Cash System.</i>		
Policies in force 31st December, 1885 .....	4,512	4,314,850 73
Policies in new and renewed during 1886 .....	1,849	1,914,828 49
Gross number during 1886 .....	6,361	6,229,679 22
Less expired and cancelled in 1886 .....	1,920	1,909,612 10
Net risks in force on cash system, 31st December, 1886 .....	4,441	4,320,067 12

## BUSINESS TRANSACTED :

General Fire Insurance.

PREMIUM NOTES OR UNDERTAKINGS

On Policies in force 31st December, 1886.

	One year risks.	Two year risks.	Three year risks.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment . . . . .	550 00	152 00	208,001 00	208,703 00
Amount of premium notes, after deducting all payments thereon and assessments levied . . . . .	412 90	127 87	136,548 54	137,089 31
Amount of premium notes received during the year 1886 . . . . .	370 00	140 00	89,600 00	90,110 00
<i>Re-insurance.</i>				
Amount of premium notes given by the Company for re-insurance . . . . .			3,724 12	
Less payments thereon . . . . .			1,146 28	
Residue . . . . .			2,577 84	

## HAND-IN-HAND INSURANCE COMPANY, MUTUAL AND STOCK.

HEAD OFFICE, TORONTO, ONT.

*Commenced business 1st July, 1873.*

President—W. H. HOWLAND.

Secretary—HUGH SCOTT.

By Act 42 Vic., Cap. 85, Ontario Statutes, 1879, power was granted to this Company to raise Capital Stock and do business on the Cash System.

Authorized Stock Capital .....	\$500,000 00
Subscribed .....	100,000 00
Paid up in cash .....	20,000 00
Stock uncalled .....	80,000 00
Securities deposited with Treasurer of Ontario (par value).....	10,000 00

## LIST OF STOCKHOLDERS.

NAME.	Residence.	Amount Subscribed for.	Amount paid up in Cash.
		\$ c.	\$ c.
Austin, James.....	Toronto .....	5,000 00	1,000 00
Campbell, A. H. ....	" .....	5,000 00	1,000 00
Coffee & Co., L. ....	" .....	5,000 00	1,000 00
Dixon, B. Homer .....	" .....	5,000 00	1,000 00
Dewney, Jno. ....	" .....	5,000 00	1,000 00
Elliott, Wm .....	" .....	5,000 00	1,000 00
Fisher, D. ....	Bowmanville .....	5,000 00	1,000 00
Gzowski, Col. C. S. ....	Toronto .....	5,000 00	1,000 00
Howland, O. A. (in trust) .....	" .....	5,000 00	1,000 00
Howland, W. H. ....	" .....	5,000 00	1,000 00
Macpherson, Sir D. L. ....	" .....	5,000 00	1,000 00
MacLennan, Jas., Q.C. ....	" .....	5,000 00	1,000 00
McDonald, Mitchell D. ....	" .....	5,000 00	1,000 00
McMaster, Hon. Wm. ....	" .....	5,000 00	1,000 00
Smith, Prof. Goldwin .....	" .....	5,000 00	1,000 00
Smith, Larratt W., D.C.L. ....	" .....	5,000 00	1,000 00
Smith, Henry A. ....	London, Ont. ....	5,000 00	1,000 00
Scott, James .....	Toronto .....	5,000 00	1,000 00
Smith, Hon. D. A. ....	Montreal .....	5,000 00	1,000 00
Scott & Walmsley .....	Toronto .....	5,000 00	1,000 00
	Total .....	100,000 00	20,000 00

## ASSETS.

*Mortgages:*

Property in Toronto .....	\$15,186 33	
Shares, Debentures and other Securities .....	19,617 75	
		\$34,804 08
Cash on deposit to company's credit in Ontario Bank .....		5,317 36
Accrued interest .....		162 77
Cash in agents' hands .....		1,332 83
Undertakings unassessed .....		8,737 10
All other assets .....		706 65
Total .....		\$51,060 79



## LIABILITIES.

Amount required to re-insure all outstanding risks taken on cash system, being 50 per cent. of gross premiums on all cash system policies in force at December 31st, 1886 .....	7,955 71
Directors' fees .....	300 00
Total liabilities .....	<u>\$8,255 71</u>

## REVENUE ACCOUNT.

Cash received for premiums on cash system .....	\$20,002 31
“ as first payments or deposits, being part payment of premium notes .....	8,899 67
“ for interest .....	3,891 22
“ balance revenue account .....	
“ premiums, Plate Glass Branch .....	1,285 82
“ over-payment on claim .....	15 00
Total income .....	<u>\$33,594 02</u>

## EXPENDITURE.

Cash paid for commission to agents .....	\$5,129 79
“ statutory assessment or certificate .....	129 06
“ printing, stationery and advertising .....	198 45
“ salaries, Directors' and Auditors' fees .....	1,715 00
“ investigation and adjustment of claims .....	246 08
“ rent and taxes .....	733 33
“ postage, telegrams and express .....	222 20
“ Goad's plans .....	48 80
“ telephone .....	25 00
Total expenses of management .....	<u>\$8,447 71</u>
Cash paid for losses prior to 1886 .....	\$4,127 84
“ “ during 1886 .....	9,450 02
“ re-insurances .....	13,577 86
“ rebate, abatement and returned premiums .....	2,774 58
“ dividends .....	1,822 74
“ dividends .....	2,000 00
Total expenditure .....	<u>\$28,622 89</u>

## CURRENCY OF RISKS.

*Amount Covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Three years.	Four years.	Total.
<i>Insurance.</i>	\$ c.	\$ c.	\$ c.	\$ c.
Mutual . . . . .	494,638 00	173,383 00	8,500 00	676,521 00
Cash . . . . .	1,209,444 00	514,767 00	.....	1,724,211 00
Total . . . . .	1,704,082 00	688,150 00	8,500 00	2,400,732 00
<i>Re-insurance.</i>				
Mutual . . . . .	30,750 00	2,500 00	.....	33,250 00
Cash . . . . .	212,807 00	38,595 00	.....	251,402 00
Total . . . . .	243,557 00	41,095 00	.....	284,652 00
Net risks carried by Company, Dec. 31, 1886 . . . . .	1,460,525 00	647,055 00	8,500 00	2,116,080 00

## MOVEMENT IN RISKS.

	Number.	Amount.
<i>FIRE RISKS—Mutual System.</i>		\$ c.
Policies in force 31st December, 1885 . . . . .	283	489,486 00
“ new and renewed during 1886 . . . . .	297	663,753 00
Gross number during 1886 . . . . .	580	1,153,239 00
Less expired and cancelled in 1886 . . . . .	289	476,718 00
Net risks in force on mutual system 31st December, 1886 . . . . .	291	676,521 00
<i>FIRE RISKS—Cash System.</i>		
Policies in force 31st December, 1885 . . . . .	1541	1,689,194 00
“ new and renewed during 1886 . . . . .	704	1,689,969 00
Gross number during 1886 . . . . .	2245	3,379,163 00
Less expired and cancelled in 1886 . . . . .	1720	1,654,952 00
Net risks in force on Cash system 31st December, 1886 . . . . .	525	1,724,211 00
<i>PLATE GLASS RISKS.</i>		
Policies in force 31st December, 1885 . . . . .	191	68,666 00
“ new and renewed during 1886 . . . . .	197	69,000 00
Gross number during 1886 . . . . .	388	137,666 00
Less expired and cancelled in 1886 . . . . .	57	21,088 00
Net risks in force 31st December, 1886 . . . . .	331	116,578 00

BUSINESS TRANSACTED :

General Fire, Plate Glass, and Inland Marine, Insurance.

PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force December 31st, 1886.*

	One year risks.	Three year risks.	Total.
	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	6,800 03	1,937 07	8,737 10
Amount of all premium notes after deducting all payments thereon and assessments levied.....	6,800 03	1,937 07	8,737 10
Amount of premium notes received during the year 1886 .....	7,606 12	793 55	8,399 67

THE MILLERS' AND MANUFACTURERS' INSURANCE COMPANY,  
MUTUAL AND STOCK.

HEAD OFFICE, TORONTO, ONT.

*Commenced business 1st September, 1885.*

President—JAMES GOLDIE.

Secretary—W. IRELAND SCOTT.

Subscribed stock capital.....	\$125,000 00
Paid up in cash.....	12,250 00
Securities deposited with Treasurer of Ontario.....	10,000 00
Capital stock.....	112,500 00

ASSETS.

Shares, debentures and other securities.....	\$10,000 00
Cash on deposit in Central Bank, Toronto.....	15,251 57
Undertakings, unassessed amount.....	14,782 15
Uncollected premiums.....	1,364 30
Unpaid call on stock.....	250 00
Fire equipment.....	637 18
Total assets.....	<u>\$42,285 20</u>

LIABILITIES.

Amount of unpaid losses.....	\$3,430 00
“ “ other sources.....	2,756 95
Total liabilities to public.....	<u>\$6,186 95</u>
Liabilities to Stockholders—	
Call on Stock, paid.....	\$12,250 00
“ Unpaid, and carried to Assets, as above.....	250 00
Total.....	<u>\$12,500 00</u>

INCOME.

Cash received on stock.....	\$ 5,550 00
“ as first payments or deposits, being part payment of premium notes.....	16,391 08
“ for interest.....	799 23
“ commission account.....	314 25
Total income.....	<u>\$23,054 56</u>

EXPENDITURE.

Cash paid for interest.....	
“ statutory certificate.....	\$ 61 87
“ travelling expenses.....	960 30
“ rent.....	400 00
“ salaries, directors' and auditors' fees.....	3,766 82
“ printing, stationery and advertising.....	338 11
“ postage, telegrams and express.....	129 90
“ assessment Underwriters' Association.....	25 00
“ sundries.....	18 63
Total expenses of management ( <i>Carried forward</i> ).....	<u>\$5,700 63</u>

EXPENDITURE.—*Continued.*

Total expenses of management ( <i>Brought forward</i> ) . . . . .	\$5,700 63
Cash paid for loss which occurred during 1886 . . . . .	10 00
“ re-insurance . . . . .	1,019 52
“ rebate . . . . .	1,236 70
“ for dividends . . . . .	1,191 08
Total expenditure . . . . .	<u>\$9,157 93</u>

## CURRENCY OF RISKS.

*Amount Covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Three years.	Total.
	\$ c.	\$ c.	\$ c.
Mutual insurance . . . . .	689,218 00	52,800 00	742,018 00
Re-insurance . . . . .	22,000 00	13,000 00	35,000 00
Net risks . . . . .	667,218 00	39,800 00	707,018 00

## MOVEMENT IN RISKS.

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 . . . . .	80	241,100 00
“ new and renewed during 1886 . . . . .	315	881,225 00
Gross number during 1886 . . . . .	395	1,122,325 00
Less expired or cancelled in 1886 . . . . .	151	380,307 00
Net risks in force on mutual system 31st December, 1886 . . . . .	244	742,018 00

## BUSINESS TRANSACTED:

## Manufacturing Risks.

## PREMIUM NOTES OR UNDERTAKINGS.

*On Policies in force December 31st, 1886.*

	One year risks.	Three year risks.	Total.
	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment . . . . .	14,513 37	1,288 30	15,801 67
Amount of all premium notes, after deducting all payments thereon and assessments levied . . . . .	14,573 37	1,288 30	15,861 67
Amount of premium notes received during the year 1886 . . . . .	16,357 78	1,397 60	17,755 38



## LIST OF STOCKHOLDERS.

NAME.	ADDRESS.	No. of shares.	Amount of	Amount of
			stock.	10% cash.
			\$ c.	\$ c.
W. H. Howland.....	Toronto.....	50	5,000 00	500 00
James Goldie.....	Guelph.....	50	5,000 00	500 00
J. B. Armstrong.....	".....	50	5,000 00	500 00
W. Bell & Co.....	".....	50	5,000 00	500 00
D. McRae.....	".....	20	2,000 00	200 00
Robert Noble.....	Norval.....	30	3,000 00	300 00
Wm. Farrish.....	Rockwood.....	10	1,000 00	100 00
Henry Hortop.....	Everton.....	10	1,000 00	100 00
A. Watts.....	Brantford.....	50	5,000 00	500 00
David Plewes.....	".....	10	1,000 00	100 00
A. H. Baird.....	Paris.....	10	1,000 00	100 00
C. Whitelaw.....	".....	10	1,000 00	100 00
Thos. O'Neil.....	".....	5	500 00	50 00
Lyman Miller.....	Woodstock.....	5	500 00	50 00
D. W. Karm & Co.....	".....	20	2,000 00	200 00
R. Whitelaw.....	".....	10	1,000 00	100 00
James Hay & Co.....	".....	50	5,000 00	500 00
Wm. Partlo.....	Ingersoll.....	20	2,000 00	200 00
Bradbury & Co.....	".....	10	1,000 00	100 00
Noxon Bros. Mfg Co'y.....	".....	30	3,000 00	300 00
J. D. Saunby.....	London.....	20	2,000 00	200 00
W. McBride.....	Strathroy.....	10	1,000 00	100 00
Hugh Mustard.....	Wyoming.....	10	1,000 00	100 00
Robert Stewart.....	Guelph.....	10	1,000 00	100 00
Robert Forbes.....	".....	20	2,000 00	200 00
R. & W. S. Law.....	Georgetown.....	10	1,000 00	100 00
Creelman Bros.....	".....	10	1,000 00	100 00
John R. Barber.....	".....	20	2,000 00	200 00
S. Neelon.....	St. Catharines.....	30	3,000 00	300 00
James Norris.....	".....	30	3,000 00	300 00
R. H. Smith & Co.....	".....	10	1,000 00	100 00
Taylor & Bate.....	".....	10	1,000 00	100 00
Charles Riordan.....	Merritton.....	50	5,000 00	500 00
J. Zingsheim.....	Hamilton.....	30	3,000 00	300 00
J. L. Spink.....	Toronto.....	30	3,000 00	300 00
H. A. Baird.....	".....	30	3,000 00	300 00
P. McCabe.....	Port Hope.....	10	1,000 00	100 00
Hugh Scott.....	Toronto.....	30	3,000 00	300 00
William Sutton.....	Simcoe.....	10	1,000 00	100 00
Harold Barrett.....	Port Hope.....	10	1,000 00	100 00
Sadler, Dundas & Co.....	Lindsay.....	30	3,000 00	300 00
A. H. Campbell.....	Toronto.....	50	5,000 00	500 00
McLaughlin & Moore.....	".....	25	2,500 00	250 00
R. W. Elliott.....	".....	10	1,000 00	100 00
Thomas McKay & Co.....	Ottawa.....	10	1,000 00	100 00
John Hall & Co.....	Brockville.....	20	2,000 00	200 00
King Bros.....	Whitby and Toronto.....	15	1,500 00	150 00
Goldie & McCulloch.....	Galt.....	50	5,000 00	500 00
Cherry Bros.....	Preston.....	10	1,000 00	100 00
George Pattinson.....	".....	30	3,000 00	300 00
Jacob Hilborn.....	Blair.....	10	1,000 00	100 00
Angus McNally.....	".....	10	1,000 00	100 00
Joseph E. Seagram.....	Waterloo.....	30	3,000 00	300 00
Lewis Kribs.....	Hespeler.....	10	1,000 00	100 00
Wm. Wilson.....	Toronto.....	50	5,000 00	500 00
Total.....		1,250	\$125,000 00	\$12,500 00

THE ONTARIO MUTUAL FIRE INSURANCE COMPANY.

*Commenced business 2nd September, 1867.*

*President*—ANDREW MCCORMICK.

|

*Secretary*—P. F. BOYLE.

Unassessed premium note capital, \$12,589.04.

Deposited with Treasurer of Ontario, \$2,000.

ASSETS

Cash value of shares, bonds, debentures and securities . . . . .	\$2,000 00
Actual cash on hand at head office . . . . .	\$23 40
Cash on deposit to the Company's credit, not drawn against, in the Bank of London . . . . .	672 60
Cash in the Dominion Savings Society at London . . . . .	88 13
	<hr/>
	784 13
Cash in Agents' hands, acknowledged by them to be due, and considered good . . . . .	2,254 33
Amount unpaid of assessments levied during 1886 . . . . .	504 00
" " " in prior years (not ex- tended) . . . . .	\$2,776 25
Amount of notes, or due bills, less than one year overdue . . . . .	675 91
" " more " " (not ex- tended) . . . . .	\$2,284 02
Amount of premium notes in force after deducting all pay- ments thereon and assessments levied . . . . .	12,589 04
Less premium notes given for reinsurance . . . . .	111 35
	<hr/>
	12,477 69
Accrued interest . . . . .	16 26
All other assets . . . . .	255 00
	<hr/>
Total assets . . . . .	<u>\$18,967 32</u>

LIABILITIES.

Amount of losses adjusted . . . . .	\$3,572 00
" required to reinsure all outstanding risks taken on the cash system, being 50 per cent. of gross premiums on all cash system policies in force at 31st December, 1886 . . . . .	7,175 92
Due Agents . . . . .	155 10
Amount of borrowed money . . . . .	1,000 00
	<hr/>
Total liabilities . . . . .	<u>\$11,903 02</u>

## RECEIPTS.

Cash received as first payments, being part payments of premium notes..	\$2,162 35
“ for assessments levied in 1886 .....	2,873 90
“ “ “ years prior to 1886.....	1,053 58
“ for premiums on cash system.....	5,101 91
“ for interest.....	198 88
“ from fees, and extra risks.....	71 32
“ money borrowed.....	4,500 00
Total receipts.....	<u>\$15,961 94</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid to agents for commission ....	\$1,974 91
“ for law costs .....	69 12
“ fuel and light.....	30 83
“ statutory assessment, license, etc.....	105 01
“ printing, stationery and advertising.....	108 48
“ rent and taxes.....	193 54
“ salaries, directors' and auditors' fees.....	2,095 00
“ travelling expenses .....	150 25
“ postage, telegrams and express.....	216 94
“ interest.....	92 90
Total expenses of management...	<u>\$5,036 98</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred prior to 1886.....	\$1,472 25
“ “ “ during 1886.....	4,125 20
	<u>5,597 45</u>
“ re-insurances .....	149 27
“ in repayment of loans.....	4,500 00
“ for rebate, abatement and returned premiums...	62 16
“ incidentals.....	143 00
Total expenses .....	<u>\$15,488 86</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Two years.	Three years.	Total.
<i>Insurance.</i>	\$ c.	\$ c.	\$ c.	\$ c.
Mutual.....		2,120 00	1,210,133 00	1,212,253 00
Cash .....	31,575 00	8,610 00	1,489,508 00	1,529,693 00
Total .....	31,575 00	10,730 00	2,699,641 00	2,741,946 00
<i>Reinsurance.</i>				
Mutual.....				2,000 00
Cash .....				1,500 00
Total .....				3,500 00
Net risks carried by Company, December 31st, 1886.....				2,738,446 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	1,471	1,158,466 00
“ new and renewed during 1886 .....	553	460,420 00
Gross number during 1886.....	2,024	1,618,886 00
Less expired and cancelled in 1886 .....	546	406,633 00
Net risks in force on mutual system 31st December, 1886 .....	1,478	1,212,253 00
<i>Cash System.</i>		
Policies in force 31st December, 1885 .....	2,714	1,472,936 00
“ new and renewed during 1886 .....	871	495,354 00
Gross number during 1886.....	3,585	1,968,290 00
Less expired and cancelled.....	825	438,597 00
Net risks in force on cash system 31st December, 1886 .....	2,760	1,529,693 00

## CLASSIFICATION OF RISKS:

## General Fire Insurance Business.

## PREMIUM NOTES AND UNDERTAKINGS.

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	23,678 80	23,678 80
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	12,589 04	12,589 04
Amount of premium notes received during the year 1886.....	12,046 16	12,046 16

## COUNTY OF PERTH MUTUAL FIRE INSURANCE COMPANY.

*Commenced business 1st December, 1863.**President*—JOHN HYDE, M.D.*Secretary*—CHAS. PACKERT.

Deposited with Treasurer of Ontario, \$2,000.

Unassessed premium note capital, \$74,108.41.

## ASSETS.

Market value of debentures .....	\$13,000 00	
Actual cash on deposit in Mowat's Bank, Stratford .....	7,865 77	
		\$20,865 77
Cash in agents' hands acknowledged by them to be due, and considered " good .....		989 31
Amount unpaid of assessments levied during 1886 .....		2,665 10
" of short date notes, or due bills, less than one year overdue .....		1,329 00
" of premium notes in force, after deducting all payments thereon and assessments levied .....	\$74,108 41	
less residue of premium notes given for reinsurance ..	5,133 97	
		68,974 44
" of interest accrued .....		425 00
" due by other companies .....		323 40
Total assets .....		\$95,572 02

## LIABILITIES.

Amount unpaid of losses reported .....	\$1,703 80
" required to reinsure all outstanding risks taken on the cash system, being fifty per cent. of gross premiums on all cash system policies in force at 31st December, 1886 .....	5,775 42
" of sundries .....	7 33
Total liabilities .....	\$7,486 55

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$4,008 63
Cash received as first payments, being part payment of premium notes .....	\$12,341 86
" for assessments levied in 1886 .....	5,290 86
" " " years prior to 1886 .....	1,915 80
" for premiums on cash system .....	6,152 96
" for interest .....	1,078 54
" from extra premiums, etc. ....	136 67
Total receipts .....	\$26,916 69

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents .....	\$3,296 94
“ law costs .....	24 15
“ fuel and light .....	51 08
“ investigation and adjustment of claims .....	156 97
“ statutory assessment and license .....	134 59
“ printing stationary and advertising .....	631 95
“ rent and taxes .....	150 00
“ salaries, directors' and auditors' fees .....	1,046 40
“ travelling expenses .....	134 25
“ postage, telegrams and express .....	329 11
“ other expenses .....	109 48
Total expenses of management .....	\$6,944 92

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	\$12,436 42
“ “ “ prior to 1886 .....	1,234 25
“ reinsurance .....	1,134 53
“ rebate .....	476 41
“ agents' accounts .....	\$406 82
“ Goads' plans .....	372 70
“ office furniture .....	53 50
	833 02
Total expenditure .....	\$23,059 55

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Three years.	Total.
	\$ c.	\$ c.	\$ c.
Mutual .....	79,648 00	3,171,866 00	3,251,514 00
Cash .....	215,845 00	852,400 00	1,068,245 00
Total at risk .....	295,493 00	4,024,266 00	4,319,759 00
Reinsured Mutual system .....		65,850 00	
Cash system .....		6,666 66	78,516 66
Net risks at 31st December, 1886 .....		72,516 66	4,241,242 31



## MOVEMENT IN RISKS.

	Number.	Amount.
		\$ c.
<i>Mutual System.</i>		
Policies in force 31st December, 1885 .....	2323	2,819,886 00
“ new and renewed during 1886 .....	1059	1,319,503 00
Gross number during 1886. ....	3382	4,139,759 00
Less expired and cancelled in 1886. ....	732	887,875 00
Net risks in force on mutual system 31st December, 1886 .....	2650	3,251,514 00
<i>Cash System.</i>		
Policies in force 31st December, 1885 .....	1180	848,961 00
“ new and renewed during 1886 .....	852	672,445 00
Gross number during 1886. ....	2032	1,521,406 00
Less expired and cancelled in 1886. ....	556	453,161 00
Net risks in force on cash system 31st December, 1886. ....	1476	1,068,245 00

## CLASSIFICATION OF RISKS :

Farm and non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*(on Policies in force 31st December, 1886.)*

	One year risks.	Three year risks.	Total.
	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment. ....	3,640 77	97,352 88	100,993 65
Amount of all premium notes, after deducting all payments thereon and assessments levied. ....	2,067 49	72,040 92	74,108 41
Amount of premium notes received during the year 1886. ....	3,640 77	53,533 34	57,174 11
Residue of premium notes given for reinsurance .....			5,133 97

## WATERLOO MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, WATERLOO.

*Commenced business 7th March, 1863.**President*—CHAS. HENDRY.*Secretary*—C. M. TAYLOR.

Unassessed premium note capital, \$157,251.42.

Deposited with Government of Ontario. \$13,585.00 par value.

## ASSETS.

Cash value of real estate, less incumbrances.....	\$ 6,564 84
Cash value of mortgages .....	39,600 00
“ shares, bonds, debentures and securities.....	12,775 00
Cash on deposit to the Company's credit, not drawn against, in the Molson's Bank, Waterloo .....	16,211 49
Cash on hand at head office .....	275 99
Cash in agents' hands, acknowledged by them to be due, and considered good .....	1,842 15
Amount unpaid of assessments levied during 1886 .....	2,044 14
“ of short date notes or due bills, less than one year overdue.....	3,847 14
“ of premium notes in force, after deducting all payments thereon and assessments levied .....	\$161,632 46
Less residue of premium notes given for re-insurance.....	4,381 04
	<hr/> 157,251 42
Amount of interest due and accrued .....	1,655 06
Total assets .....	<hr/> \$242,067 23

## LIABILITIES.

Amount of losses reported .....	\$3,405 00
Amount required to re-insure all outstanding risk taken on the cash system, being 50 per cent. of gross premiums on all cash system policies in force at 31st December, 1886.....	39,039 42
Total liabilities.....	<hr/> \$42,444 42

## RECEIPTS.

Cash at head office as per last statement (not extended).....	\$0.63
Cash received for matured municipal debentures.....	\$1,587 81
“ as first payments, being part payment of premium notes....	21,043 62
“ for assessments of 1886 .....	27,934 73
“ “ years prior to 1886 .....	2,733 85
“ premiums on cash system .....	44,575 10
“ for interest .....	3,096 26
Cash receipts from transfer fees.....	163 31
“ extra premiums .....	423 41
“ rent .....	100 00
Total receipts .....	<u>\$101,658 09</u>

## EXPENDITURE.

*Expenses of Management:*

Amount paid for commission to agents .....	\$14,164 36
“ law costs .....	306 66
“ fuel and light .....	67 73
“ investigation and adjustment of claims .....	2,887 29
“ statutory assessment or certificate.....	330 32
“ printing, stationery and advertising.....	1,916 15
“ taxes .....	213 85
“ salaries, directors' and auditors' fees.....	5,484 40
“ postage, telegrams and express.....	784 43
“ travelling expenses.....	39 00
“ other expenses.....	585 86
Total expenses of management .....	<u>\$26,780 05</u>

*Miscellaneous Payments:*

Cash paid for losses which occurred during 1886.....	\$63,530 17
“ “ “ prior to 1886 .....	1,259 33
“ re-insurance .....	<u>\$64,789 50</u>
“ rebate, abatement and returned premiums .....	2,244 06
“ debentures and mortgages.....	2,215 11
“ bonus to agents .....	16,300 00
“ .....	2,999 06
Total expenditure .....	<u>\$115,327 78</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Three years.	Total.
	\$ c.	\$ c.	\$ c.
<i>Insurance.</i>			
Mutual.....		3,557,399 67	3,557,399 67
Cash .....	1,414,457 94	5,872,803 80	7,287,261 74
Total.....	1,414,457 94	9,430,203 47	10,844,661 41
<i>Reinsurance.</i>			
Mutual.....		67,150 00	67,150 00
Cash .....	72,420 00	62,100 00	134,520 00
Net risks carried by Company at December 31, 1886 .....			10,642,991 41

## MOVEMENT IN RISKS.

	Number.	Amount.
<i>Mutual System.</i>		
Policies in force 31st December, 1885 .....	2,421	3,312,366 67
“ new and renewed during 1886. ....	1,098	1,514,341 00
Gross number during 1886. ....	3,519	4,826,707 67
Less expired and cancelled in 1886. ....	899	1,269,308 00
Net risks in force on mutual system 31st December, 1886 .....	2,620	3,557,399 67
<i>Cash System.</i>		
Policies in force 31st December, 1885 .....	8,978	7,397,787 74
“ new and renewed during 1886. ....	4,213	4,031,948 00
Gross number during 1886. ....	13,191	11,429,735 74
Less expired and cancelled in 1886. ....	3,814	4,142,474 00
Net risks in force on cash system 31st December, 1886. ....	9,377	7,287,261 74

## CLASSIFICATION OF RISKS:

## General Fire Insurance.

## PREMIUM NOTES OR UNDERTAKINGS.

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	£ c.	£ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	294,288 89	294,288 89
Amount of all premium notes, after deducting all payments thereon and assessments levied. ....	161,632 46	161,632 46
Amount of premium notes received during the year 1886. ....	107,535 24	107,535 24
Residue of premium notes given for reinsurance. ....	4,381 04	4,381 04



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RECAPITULATION  
OF  
ASSETS, LIABILITIES, INCOME AND EXPENDITURE  
OF ALL  
CASH-MUTUAL FIRE INSURANCE COMPANIES.

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## CASH MUTUAL COMPANIES.

ASSETS FOR YEAR ENDING 31ST DECEMBER, 1886.

NAME OF COMPANY.	Value of Real Estate, less Encumbrances.		Mortgages, Bonds, Debentures, or other Securities.		Interest Due and Accrued.		Cash at Head Office and Bank Balances.		Agents' Balances.		Due on Assessments of 1886.		Short Date Notes or Due Bills.		Unassessed Premium Notes.		All other Assets.		Total Assets.		Subscribed Capital Stock Uncalled.	
	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.
City Mutual of London.....							7,102	60	947	05			50	00	11,266	91			19,366	56		
Gore District.....			66,500	00	1,690	69	29,534	47	3,214	05	72	56			131,511	47			235,523	24		
Hand-in-Hand .....			31,804	08			5,317	36	1,332	33					8,737	10	869	42	51,060	79	80,000	00
Millers and Manufacturers .....			10,000	00			15,251	57							11,782	15	2,251	48	42,285	20	112,500	00
Ontario .....			2,000	00	16	26	784	13	2,251	33	504	00	675	91	12,477	69	255	00	18,967	32		
Perth County .....			13,000	00	425	00	7,865	77	989	31	2,665	10	1,329	00	68,971	44	323	40	95,572	02		
Waterloo.....	6,561	84	32,375	00	1,655	06	16,487	48	1,842	15	2,044	14	3,847	14	157,251	42			242,007	23		
Total.....	6,561	84	178,679	08	3,787	01	82,343	38	10,579	72	5,285	80	5,902	05	406,001	18	3,699	30	701,842	36		132,500 00

(Government Deposits, as follows:—City Mutual, \$6,000; Gore District, \$20,000; Hand-in-Hand, \$10,000; Millers & Manufacturers, \$10,000; Ontario, \$2,000; Perth County, \$6,000; Waterloo, \$13,585.

## CASH MUTUAL COMPANIES.

LIABILITIES FOR YEAR ENDING 31st DECEMBER, 1886.

NAME OF COMPANY.	Losses unpaid at Dec. 31, 1886, though subse- quently discharged.	Unearned Premiums on Cash System Risks, calculated at 50 per cent. of Gross Pre- miums.		All other Liabilities.		Total Liabilities.		Number of Policies.	Amount at Risk.
	%	£	c.	%	£	%	c.		
City Mutual of London .....									
Gore District .....	5,882 46	1,070 55		5,000 00		6,070 55		309	355,019 00
Hand-in-Hand .....						29,357 01		6,273	6,867,679 31
Millers and Manufacturers .....	3,430 00	7,955 71		300 00		8,255 71		816	2,409,732 01
Ontario .....	3,572 00			2,736 95		6,186 95		214	742,018 00
Perth County .....	1,703 80	7,175 92		1,155 10		11,903 02		1,298	2,741,946 00
Waterloo .....	3,405 00	5,775 42		7 33		7,486 55		4,126	1,319,759 00
		39,039 42				12,444 42		11,997	10,844,661 41
Total .....	17,983 26	84,491 57		9,219 38		111,704 21		28,003	28,271,814 73

## CASH MUTUAL COMPANIES.

RECEIPTS FOR YEAR ENDING 31st DECEMBER, 1886.

NAME OF COMPANY.	Calls on Stock.	First Payments on Pre-		Assessments of 1886.		Assessments due before 1886.		Premiums on Cash System.		Interest.		Fees, Licenses and Extra Premiums.		Sale of Securities.		Other Sources.		Total.	
		£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.
City Mutual of London																		9,216	01
Gore District																5,002	50	86,861	69
Hand-in-Hand																4,313	28	33,394	02
Millers and Manufacturers																1,300	82	23,054	56
Ontario	5,550	00														314	25	13,961	94
Perth County																4,571	32	26,916	69
Waterloo																136	67	101,658	09
																686	72		
Total	5,550	00		36,099	49	5,703	22	110,574	37	13,480	52	342	34	1,587	81	16,925	56	297,263	00

## CASH-MUTUAL COMPANIES.

EXPENDITURE FOR YEAR ENDING 31ST DECEMBER, 1886.

NAME OF COMPANY.	Investment and Equipment.		Repayment of Loans.		Amount paid for Losses.		Commission and Bonus to Agents.		Costs in Law and Equity.		Reinsurance.		Rebate and Returned Premiums.		Interest.		Statutory Assessments, also Fees for Licenses, and Certificates.		Salaries and General Expense Account.		Dividends and all other Payments.		Total.	
	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.
City Mutual of London ..					349	24	787	60			208	07	17	86			20	00	700	64			2,113	11
Gore District ..					52,943	82	10,326	98	33	00	6,439	17	1,460	91			215	29	9,755	53			81,394	70
Hand-in-Hand ..					13,577	86	5,129	79			2,774	58	1,822	74			129	06	3,188	86	2,000	00	28,622	89
Millers and Manufacturers ..					10	00					1,019	52	1,236	70			61	87	5,638	76	1,191	08	9,157	93
Ontario ..			4,500	00	5,597	45	1,974	91	69	12	149	27	62	16	92	90	105	01	2,438	04			15,488	86
Perth County ..					13,670	67					1,134	53	476	41			134	59	6,810	33	406	82	22,633	35
Waterloo ..	16,300	00			64,789	50	17,163	42	306	66	2,214	06	2,215	11			330	82	11,978	71			115,327	78
Total ..	16,300	00	4,500	00	150,938	54	35,582	70	408	78	13,989	20	7,321	89	92	90	996	14	41,010	87	3,597	90	274,738	92



STRICTLY MUTUAL FIRE INSURANCE COMPANIES.

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YEAR ENDING 31<sup>ST</sup> DECEMBER, 1886.

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# STRICTLY MUTUAL FIRE INSURANCE COMPANIES.

## BAY OF QUINTE AGRICULTURAL MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, PICTON.

*Commenced business 31st October, 1874.*

*President*—ARCHELAUS SOUTHARD. | *Secretary*—J. ROLAND BROWN.

Unassessed premium note capital, \$14,549.27.

### ASSETS.

Actual cash on hand at head office.....	\$ 105 62
Amount unpaid of assessments levied in 1886 .....	133 36
“ “ before (not extended) ..	\$44 76
Amount of premium notes in force after deducting all payments thereon and assessments levied.....	14,549 27
Total assets .....	<u>\$14,788 25</u>

### LIABILITIES.

Bill payable .....	\$300 00
Total liabilities.....	<u>\$300 00</u>

### RECEIPTS.

Balance of cash on hand as per last statement (not extended) ..	\$66 17
Cash received for first payments, being part payment of premium notes ..	650 25
“ assessments levied in 1886 .....	1,214 30
“ “ before 1886 .....	65 75
“ borrowed money ..	700 00
“ transfer fees .....	8 10
Total receipts .....	<u>\$2,638 40</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents .....	\$150 50
“ interest .....	6 04
“ salaries, directors' and auditors' fees .....	449 00
“ rent and taxes .....	2 00
“ statutory assessment .....	27 08
“ printing, stationery and advertising .....	69 73
“ office expenses .....	9 18
“ adjustment of claims .....	4 00
Total expenses of management .....	717 53
Cash paid for losses which occurred during 1886 .....	1,473 70
“ repayment of loans .....	400 00
“ assessment returned .....	6 48
Cash paid agent, balance due from 1885 .....	1 24
Total expenditure .....	<u>\$2,598 95</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Four years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Mutual .....	921,810 00	400 00	138,195 00	1,060,405 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Total.
		\$ c.
Policies in force 31st December, 1885 .....	729	949,905 00
Policies, new and renewed during 1886 .....	301	396,455 00
Gross number during 1886 .....	1,030	1,346,360 00
Less expired and cancelled in 1886 .....	238	285,955 00
Net risks in force on mutual system, 31st December, 1886 .....	792	1,060,405 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Risks.			Total.
	Three years.	Four years.	Five years.	
	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment. . . . .	14,785 45	8 00	3,157 70	17,945 15
Amount of all premium notes after deducting all payments thereon and assessments levied. . . . .	12,124 29	5 80	2,419 18	14,549 27
Amount of premium notes received during year 1886	6,109 31	.....	252 25	6,361 56

# BERTIE AND WILLOUGHBY FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, RIDGEWAY.

*Commenced business 6th February, 1880.*

*President*—WALTER E. ELLSWORTH.

*Secretary*—H. N. HIBBARD.

Unassessed premium note capital, \$10,104.87.

## ASSETS.

Actual cash on hand at head office .....	\$50 67
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	10,104 87
Total assets .....	<u>\$10,155 54</u>

## LIABILITIES.

Amount of losses adjusted .....	\$580 00
Total liabilities .....	<u>\$580 00</u>

## RECEIPTS.

Cash at head office as per last statement (not extended) .....	\$6 11
Cash received for fees .....	\$385 50
“ as first payments, being part payment of premium notes .....	268 91
“ steam thresher licenses and permits .....	14 00
Total receipts .....	<u>\$668 41</u>

## EXPENDITURE.

### *Expenses of Management:*

Amount paid to agents for commission and fees .....	\$213 00
“ statutory assessment .....	16 77
“ printing, stationery and advertising .....	30 09
“ salaries, directors' and auditors' fees .....	317 00
“ postage, telegrams, express, etc .....	13 43
“ travelling expenses .....	13 90
“ incidental expenses .....	6 50
Total expenses of management .....	<u>610 69</u>
Cash paid for losses which occurred during 1886 .....	6 00
“ rebate, abatement and returned premium .....	7 16
Total expenditure .....	<u>\$623 85</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual . . . . .	671,929 00	671,929 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 . . . . .	507	588,152 00
“ new and renewed during 1886 . . . . .	257	336,437 00
Gross number during 1886 . . . . .	764	924,589 00
Less expired and cancelled in 1886 . . . . .	213	252,660 00
Net risks in force 31st December, 1886 . . . . .	551	671,929 00

## CLASSIFICATION OF RISKS:

Farm and non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment . . . . .	10,593 66	10,593 66
Amount of all premium notes, after deducting all payments thereon and assessments levied . . . . .	10,104 87	10,104 87
Amount of premium notes received during the year 1886 . . . . .	5,322 65	5,322 65

## BLANSHARD MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, WOODHAM.

*Commenced business 27th March, 1876.**President*—W. M. T. SANDERSON.*Secretary*—W. M. JOHNSTON.

Unassessed premium note capital, \$15,605.25.

## ASSETS.

Actual cash on hand at head office.....	\$ 87 67
Amount unpaid of assessments levied prior to 1886 (not extended).\$37 95	
“ “ “ during 1886 .....	185 00
Amount of premium notes in force after deducting all payments thereon and assessments levied.....	15,605 25
Total assets .....	<u>\$15,877 92</u>

## LIABILITIES.

Amount of losses adjusted .....	\$2,882 00
“ money borrowed.....	1,545 00
“ interest accrued.....	65 70
Total liabilities.....	<u>\$4,492 70</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$105 84
Cash for assessments levied in 1886 .....	\$2,629 83
“ “ “ years prior to 1886.....	4 75
Cash borrowed.....	\$1,157 00
Total receipts.....	<u>\$3,791 58</u>

## EXPENDITURES.

*Expenses of Management :*

Amount paid for travelling expenses.....	\$ 8 00
“ “ statutory assessment.....	22 57
“ “ interest .....	27 88
“ “ salaries and directors' fees.....	60 00
“ “ postage, etc.....	4 20
“ “ fuel and light.....	1 75
“ “ printing, stationery and advertising.....	33 35
“ “ law costs.....	13 00
Expenses of management .....	<u>\$170 75</u>
Cash paid for losses which occurred during 1886.....	2,882 00
“ repayment of loans.....	757 00
Total expenditure.....	<u>\$3,809 75</u>



## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual .....	796,520 00	796,520 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	577	778,095 00
“ new and renewed during 1886 .....	205	321,880 00
Gross number during 1886 .....	782	1,099,975 00
Less expired and cancelled in 1886 .....	217	303,455 00
Net risks in force on mutual system 31st December, 1886 .....	565	796,520 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of all premium notes held by Company, and legally liable to assessment .....	19,913 50	19,913 50
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	15,605 25	15,605 25
Amount of premium notes received during the year 1886 .....	7,747 50	7,747 50

## NORTH BLENHEIM MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, CHESTERFIELD.

*Commenced business 15th August, 1861.**President*—THOMAS LOCKHART.*Secretary*—GEO. MIDDLEMAS.

Unassessed premium note capital, \$38,083.85.

## ASSETS.

Amount of premium notes in force after deducting all payments thereon and assessments levied .....	\$38,083 85
Total assets .....	<u>\$38,083 85</u>

## LIABILITIES.

Money borrowed .....	\$150 00
Balance due Treasurer .....	9 04
Total liability .....	<u>\$159 04</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$39 88
Cash received for membership fees .....	\$198 65
Total receipts .....	<u>\$198 65</u>

## EXPENDITURE.

*Expenses of Management :*

Amounts paid for printing, stationery and advertising .....	\$2 00
“ interest .....	10 50
“ travelling expenses .....	2 50
“ salaries, directors' and auditors' fees .....	191 00
“ expenses of directors' meeting .....	5 00
“ postage, telegrams and express .....	1 98
“ statutory assessment .....	20 84
Total expenses of management .....	<u>\$233 82</u>
Amount paid for loss which occurred in 1886 .....	13 75
Total expenditure .....	<u>\$247 57</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual .....	770,950 00	770,950 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	342	731,150 00
“ new and renewed during 1886 .....	99	203,550 00
Gross number during 1886 .....	441	934,700 00
Less expired and cancelled in 1886 .....	81	163,750 00
Net risk in force on mutual system 31st December, 1886 .....	360	770,950 00

## CLASSIFICATION OF RISKS:

Farm property exclusively.

## PREMIUM NOTES OR UNDERTAKINGS.

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	38,547 50	38,547 50
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	38,083 85	38,083 85
Amount of premium notes received during the year 1886 .....	10,177 50	10,177 50

## COUNTY OF BRANT FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, PARIS.

*Commenced business 27th May, 1861.**President*—M. FREEMAN.*Secretary*—WM. TURNBULL.

Unassessed premium note capital, \$90,514.12.

## ASSETS.

Cash on hand at head office .....	\$589 10
Amount unpaid of assessments levied during 1886 .....	1,135 79
“ “ “ in prior years (not extended) \$143 79	
“ of premium notes in force, after deducting all payments thereon and assessments levied .....	90,514 12
Total assets .....	<u>\$92,239 01</u>

## LIABILITIES.

Amount of losses adjusted .....	\$1,550 00
“ borrowed money .....	600 00
Total liabilities .....	<u>\$2,150 00</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$878 91
Cash received for assessments levied in 1886 .....	83,489 76
“ “ “ prior to 1886 .....	874 05
Cash borrowed .....	2,900 00
Cash receipts from cancelled policies .....	24 23
“ short policies .....	10 31
Total receipts .....	<u>\$7,298 35</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission .....	\$563 67
“ “ fuel and light .....	5 50
“ “ investigation and adjustment of claims .....	53 55
“ “ interest .....	34 77
“ “ statutory assessment .....	85 57
“ “ printing, stationery and advertising .....	37 90
“ “ rent and taxes .....	50 00
“ “ salaries, directors' and auditors' fees .....	666 70
“ “ postage, telegrams and express .....	22 80
“ “ travelling expenses .....	20 00
“ “ sundries .....	7 55
“ “ law costs .....	26 23

Total expenses of management (*carried forward*) . . . \$1,574 24

	<i>Brought forward</i> .....	\$1,574 24
<i>Miscellaneous Payments:</i>		
Cash paid for losses which occurred before 1886.....	\$50 00	
“ “ “ during 1886.....	3,663 92	
		3,713 92
Repayment of loans.....		2,300 00
Total expenditure .....		<u>\$7,588 16</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual.....	3,367,746 00	3,367,746 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	2,247	3,001,469 00
New and renewed during 1886 .....	764	1,088,455 00
Gross number during 1886 .....	3,011	4,089,924 00
Less expired and cancelled in 1886 . . . . .	572	722,178 00
Net risks in force 31st December, 1886.....	2,439	3,367,746 00

## CLASSIFICATION OF RISKS.

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS.

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company and legally liable to assessments .....	101,070 22	101,070 22
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	90,514 12	90,514 12
Amount of premium notes received during the year 1886 .....	32,320 23	32,320 23

## WEST BRUCE FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, KINCARDINE.

*Commenced business 3rd July. 1885.**President*—ROBERT BAIRD.*Secretary*—EDWARD THORNHILL.

Unassessed premium note capital, \$17,385.14.

## ASSETS.

Cash in Treasurer's hands .....	\$20 35
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	17,385 14
Total assets .....	<u>\$17,405 49</u>

## LIABILITIES.

Amount of unpaid loans .....	\$700 00
“ directors' fees .....	87 00
“ all other liabilities .....	27 25
Total liabilities .....	<u>\$814 25</u>

## RECEIPTS.

Cash received for assessments prior to 1886 .....	\$113 60
“ assessments levied in 1886 .....	238 00
“ borrowed money .....	700 00
Total receipts .....	<u>\$1,051 60</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid commission to agents .....	\$5 68
“ for rent and fuel .....	30 00
“ statutory assessment .....	4 41
“ printing, stationery and advertising .....	11 95
“ interest .....	15 80
“ salaries and directors' fees .....	123 00
Total expenses of management .....	<u>\$190 84</u>
Cash paid for losses during 1886 .....	684 20
“ “ prior to 1886 .....	70 00
Other expenditure .....	86 21
Total expenditure .....	<u>\$1,031 25</u>



## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three Years.	Total.
	\$ c.	\$ c.
Mutual .....	465,525 00	465,525 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	109	154,750 00
Policies new and renewed during 1886 .....	239	316,175 00
Gross number during 1886 .....	348	470,925 00
Less expired and cancelled in 1886 .....	3	5,400 00
Net risks in force on mutual system 31st December, 1886 .....	345	465,525 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	18,392 14	18,392 14
Amount of all premium notes after deducting all payments thereon and assessments levied .....	17,385 14	17,385 14
Amount of premium notes received during the year 1886 .....	12,482 00	12,482 00

## CANADIAN MILLERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, HAMILTON.

*Commenced business 20th September, 1878.**President*—DAVID GOLDIE.*Secretary*—SENECA JONES.

Unassessed premium note capital, \$29,481.72.

## ASSETS.

Actual cash on hand at head office .....	\$426 77	
Cash on deposit to the Company's credit, not drawn against, in Bank of Hamilton, at Hamilton .....	5,439 96	
		\$5,866 73
Amount of premium notes in force, after deducting all pay- ments thereon and assessments levied .....	29,481 72	
Less residue of premium notes given by Company for reinsur- ance .....	2,154 00	
		27,327 72
Amount unpaid of assessments and first payments levied during 1886....		187 50
Total assets .....		<u>\$33,381 95</u>

LIABILITIES—None.

## RECEIPTS.

Cash at head office and in bank, as per last statement (not extended) .....	\$1,811 15	
Cash received as first payments, being part payment of premium notes ...	\$3,354 20	
“ for assessments levied during 1886 .....	5,901 44	
“ interest ... ..	62 86	
“ carpenters' risks, transfer and other fees .....	22 50	
“ mill surveys .....	118 00	
“ commission on reinsurance .....	92 00	
Total receipts .....		<u>\$9,551 00</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission .....	\$10 80
“ statutory assessment .....	8 10
“ printing, stationery and advertising .....	95 95
“ salaries, directors' and auditors' fees .....	926 24
“ travelling expenses .....	10 80
“ postage, telegrams and express .....	45 25
“ investigation and adjustment of claims .....	5 00
“ mill surveys .....	35 00
“ office expenses .....	9 64
Total expense of management .....	\$1,146 78

*Miscellaneous Payments :*

Amount paid for losses which occurred during 1886 .....	3,667 02
“ reinsurance .....	614 00
“ rebate .....	67 62
Total expenditure .....	\$5,495 42

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three Years.	Total.
	\$ c.	\$ c.
Mutual .....	391,900 00	391,900 00
“ reinsured .....	24,000 00	24,000 00
Net risks carried by Company December 31st, 1886 .....		367,900 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	141	284,100 00
“ new and renewed during 1886 .....	62	150,300 00
Gross number during 1886 .....	203	434,400 00
Less expired and cancelled in 1886 .....	26	42,500 00
Net risks in force 31st December, 1886 .....	177	391,900 00

CLASSIFICATION OF RISKS.

The Company's business is exclusively confined to flouring mills, and their stocks and machinery.

PREMIUM NOTES OR UNDERTAKINGS.

*On Policies in force 31st December, 1886.*

	RISKS.	
	Three Years.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company and legally liable to assessment.....	45,565 70	45,565 70
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	29,481 72	29,481 72
Amount of premium notes received during the year 1886 .....	17,758 50	17,758 50
Residue of premium notes given for reinsurance .....		2,154 00

## CARADOC FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, MOUNT BRYDGES.

*Commenced business 28th June, 1884.**President*—WM. YOUNG.*Secretary*—WM. E. SAWYER.

Unassessed premium note capital, \$8,767.65.

## ASSETS.

Amount of cash on hand .....	\$25 87
“ premium notes in force, after deducting all payments thereon and assessments levied .....	8,767 65
“ unpaid assessments levied during 1886 .....	46 34
“ “ “ “ in prior year (not extended) \$1 82	
Total assets .....	<u>\$8,839 86</u>

## LIABILITIES.

Borrowed money unpaid .....	\$350 00
Total liabilities .....	<u>\$350 00</u>

## RECEIPTS.

Cash received for fees at taking of applications .....	\$69 00
“ as first payments, being part payment of premium notes....	107 00
“ for assessments levied in 1886 .....	1,252 17
“ borrowed money .....	350 00
“ from sundries .....	2 70
Total receipts .....	<u>\$1,780 87</u>

## EXPENDITURE.

<i>Expenses of Management :</i>	
Cash paid for commission to agents .....	\$105 50
“ salaries, Directors' and Auditors' fees .....	96 00
“ travelling expenses .....	2 75
“ statutory certificate .....	5 49
“ printing, stationery and advertising .....	24 68
“ postage, telegrams and express, etc .....	6 72
“ investigation and adjustment of claims .....	8 00
“ sundries .....	9 00
Total expenses of Management .....	<u>\$258 14</u>
Cash paid for losses which occurred during 1886 .....	1,590 04
“ rebate .....	13 63
Total expenditure .....	<u>\$1,861 81</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual.....	342,271 00	342,271 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	158	192,475 00
“ taken during 1886, new and renewed.....	138	179,261 00
Gross number during 1886.....	296	371,736 00
Deduct expired and cancelled in 1886.....	24	29,465 00
Net risks in force 31st December, 1886.....	272	342,271 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS.

	Five years.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	10,268 13	10,268 13
Amount of all premium notes on policies in force December 31st, 1886, after deducting all payments thereon, and assessments levied.....	8,767 65	8,767 65
Amount of premium notes received during the year 1886.....	5,377 83	5,377 83



## CULROSS MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, TEESWATER.

*Commenced business June 3rd, 1872.**President*—THOMAS ALLISON.*Secretary*—WILLIAM COLVIN.

Unassessed premium note capital, \$17,553.94.

## ASSETS.

Cash on hand at head office .....	\$107 69	
“ deposit to company's credit in Hamilton bank, Wing-		
ham agency .....	300 00	
		<u>\$407 69</u>
Amount unpaid of assessments levied during 1886 .....		193 91
Amount of premium notes in force, after deducting all payments thereon		
and assessments levied .....		17,553 94
Total assets .....		<u><u>\$18,155 54</u></u>

## LIABILITIES—(None).

## RECEIPTS.

Cash received for fees or surveys .....	\$177 50
“ assessments levied in 1886 .....	305 26
“ “ “ years prior to 1886 .....	35 42
“ interest ....	6 25
Total receipts .....	<u><u>\$524 43</u></u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents.....	\$147 00
“ statutory assessment or certificate.....	13 28
“ salaries, directors' and auditors' fees .....	110 50
“ printing, stationery, advertising and postage.....	34 50
“ other expenses .....	10 00
Expenses of management .....	<u>315 28</u>
Amount paid for losses which occurred during 1886 .....	35 00
Total expenditure . . . . .	<u><u>\$350 28</u></u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual.....	498,436 00	498,436 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	329	460,638 00
“ new and renewed during 1886 .....	156	232,472 00
Gross number during 1886 .....	485	693,110 00
Less expired and cancelled in 1886.....	141	194,674 00
Net risks in force on mutual system on 31st December, 1886.....	344	498,436 00

## CLASSIFICATION OF RISKS.

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	19,953 76	19,953 76
Amount of all premium notes, after deducting all payments thereon and assessments levied.....	17,553 94	17,553 94
Amount of premium notes received during the year 1886 .....	9,315 20	9,315 20

## DOMINION GRANGE MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, OWEN SOUND.

*President*—JESSE TRULL.*Secretary*—RICHARD J. DOYLE.

## GENERAL BRANCH.

*Commenced business March 29th, 1877.*

Unassessed premium note capital, \$26,283.88.

## ASSETS.

Cash value of mortgages .....	\$1,950 00
Actual cash on hand at head office .....	\$460 37
Cash on deposit to the Company's credit, not drawn against, in the Merchant's Bank agency at Owen Sound .....	300 63
	761 00
Amount of short date notes or due bills less than one year overdue .....	1,211 97
Amount of short date notes or due bills one year or more overdue (not extended) .....	\$417 66
Amount of premium notes in force after deducting all payments thereon and assessments levied .....	26,283 88
Amount of due and accrued interest .....	180 19
Total assets .....	<u>\$30,387 04</u>

## LIABILITIES—(None.)

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$2,359 31
Cash received as first payments or deposits, being part payment of premium notes .....	\$4,759 92
Cash received for interest .....	71 87
“ steam thresher licenses .....	14 40
“ carpenters' risks, etc. ....	3 10
“ fees .....	9 00
“ miscellaneous ..	73 13
Total receipts .....	<u>\$4,931 47</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission .....	\$190 25
“ investigation and adjustment of claims .....	275 50
“ statutory assessment .....	46 04
“ printing, stationery, advertising and books .....	208 56
“ rent and taxes .....	112 42
“ salaries, directors' and auditors' fees .....	1,293 88
“ travelling expenses .....	25 18
“ postage, telegrams and express, etc., etc .....	99 51
“ fuel, light and petty expenses .....	81 76
Total expenses of management .....	<u>\$2,333 10</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	\$2,154 53
“ “ “ prior to 1886 .....	971 60
	<u>\$3,126 13</u>
“ reinsurances .....	18 80
“ rebate, etc. ....	86 00
Total expenditure .....	<u>\$5,564 03</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Two years.	Three years.	Four years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Mutual .....	1,900 00	2,600 00	1,686,429 00	503,653 00	2,194,582 00
“ reinsured .....			6,750 00		6,750 00
Net risks actually carried by Com- pany at 31st December, 1886 .....	1,900 00	2,600 00	1,679,679 00	503,653 00	2,187,832 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	1,577	1,614,884 00
“ new and renewed during 1886 .....	594	579,698 00
Gross number during 1886.....	2,171	2,194,582 00
Less expired and cancelled in 1886. ....	397	481,045 00
Net risks in force on mutual system 31st December, 1886.....	1,774	1,713,537 00

## CLASSIFICATION OF RISKS:

Farm and non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force December 31st, 1886.*

	One year risks.	Two year risks.	Three year risks.	Four year risks.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.	32 75	48 50	2,833 19	10,134 86	38,547 30
Amount of all premium notes, after deducting all payments thereon and assessments levied	26 00	42 00	16,202 02	10,013 86	26,283 88
Amount of premium notes received during the year 1886 .....	26 00	42 00	1,441 20	10,134 86	11,644 06
Residue of premium notes given for reinsur- ance .....			77 32		77 32

## DOMINION GRANGE MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, OWEN SOUND.

*President*—JESSE TRULL*Secretary*—RICHARD J. DOYLE.

## GRANGE BRANCH.

*Commenced business March 29th, 1877.*

Unassessed premium note capital, \$112,251.82.

## ASSETS.

Cash value of real estate, less incumbrances.....	\$ 4,284 13
“ mortgages.....	11,250 00
“ shares, bonds, debentures, securities, other than foregoing..	1,300 00
Actual cash on hand at head office .....	\$ 962 17
Cash on deposit to the Company's credit, not drawn against, in the Molson's Bank Agency at Owen Sound .....	2,263 10
	3,225 27
Amount of short date notes or due bills less than one year overdue .....	3,396 04
Amount of short date notes or due bills one year or more overdue (not extended) .....	\$452 85
Amount of premium notes in force after deducting all payments thereon and assessments levied .....	112,251 82
Amount of due and accrued interest .....	668 79
Other securities .....	1,926 13
Total assets .....	<u>\$138,202 18</u>

## LIABILITIES.

Amount of loss adjusted.....	\$225 00
“ suspense account .....	17 76
“ balance of unpaid profits to members .....	637 19
Total liabilities.....	<u>\$879 95</u>



## RECEIPTS.

Cash received as first payments or deposits, being part payment of premium notes . . . . .	\$6,624 54
Cash received for interest . . . . .	1,096 89
" due bills or short date notes . . . . .	8,136 19
" steam thresher license . . . . .	124 58
" carpenters' risks, etc . . . . .	38 86
" rent . . . . .	232 42
" miscellaneous notes . . . . .	189 49
" investment account . . . . .	500 00
" sundries . . . . .	52 48
Total receipts . . . . .	<u>\$16,995 45</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission . . . . .	\$562 25
" law costs . . . . .	5 04
" investigation and adjustment of claims . . . . .	728 87
" statutory assessment . . . . .	168 08
" printing, stationery, advertising and books . . . . .	719 71
" taxes and insurance . . . . .	108 98
" salaries, directors' and auditors' fees . . . . .	3,526 65
" travelling expenses and general agency . . . . .	68 12
" postage, telegrams and express, etc., etc. . . . .	278 88
" fuel, light and other expenses . . . . .	209 60
Total expenses of management . . . . .	<u>\$6,376 18</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 . . . . .	\$4,539 90
" " " prior to 1886 . . . . .	15 00
	<u>\$4,554 90</u>
" reinsurances . . . . .	133 85
" refunds to members . . . . .	1,526 37
" investment account . . . . .	600 00
" defaulting cashier, covered by bond in course of collection . . . . .	1,909 75
" sundries . . . . .	283 41
Total expenditure . . . . .	<u>\$15,384 46</u>

## CURRENCY OF RISKS.

*Amount covered by policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Two years.	Three years.	Four years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Mutual .....	3,400 00	5,600 00	172,705 00	5,679,806 00	5,861,511 00

## CLASSIFICATION OF RISKS:

Non-hazardous.

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	4,712	5,896,033 00
Policies, new and renewed during 1886 .....	1,622	1,617,026 00
Gross number during 1886 .....	6,334	7,513,059 00
Less expired and cancelled in 1886 .....	1,260	1,651,548 00
Net risks in force on mutual system 31st December, 1886 .....	5,074	5,861,511 00

## PREMIUM NOTES OR UNDERTAKINGS.

*On Policies in force 31st December, 1886.*

	One year risks.	Two year risks.	Three year risks.	Four year risks.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company and legally liable to assessment .....	65 88	127 60	2,125 07	159,289 49	161,608 04
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	15 00	34 50	2,170 60	110,031 72	112,251 82
Amount of premium notes received during the year 1886 .....	29 88	34 50	2,170 60	38,930 94	41,165 92

# NORTH AND SOUTH DORCHESTER MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, HARRIETSVILLE.

*Commenced business 8th January, 1869.*

*President*—WILLIAM WOODS.

*Secretary*—FRANCIS KUNZ.

Unassessed premium note capital, \$8,525.82.

## ASSETS.

Cash on deposit, to the Company's credit, not drawn against, in the Agricultural Savings and Loan Company, London.....	\$1,987 14
Amount unpaid of assessments levied during 1886 .....	52 56
“ of premium notes in force, after deducting all payments thereon and assessments levied .....	8,525 82
Total assets .....	<u>\$10,565 52</u>

## LIABILITIES.

Due directors and auditors .....	\$96 00
Total liabilities .....	<u>\$96 00</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$1,969.47
Cash received as first payments, being part payments of premium notes....	\$344 59
“ for assessments levied in 1886.....	1,492 42
“ “ “ years before 1886 .....	13 45
“ for interest .....	111 64
Total receipts .....	<u>\$1,962 10</u>

## EXPENDITURE.

### *Expenses of Management :*

Amount paid for printing and stationery.....	\$17 25
“ “ statutory assessment or certificate .....	25 00
“ “ rent .....	5 00
“ “ salaries and auditors fees.....	208 50
“ “ postage, telegrams and express .....	16 90
“ “ sundries .....	1 00
Total expenses of management .....	<u>\$273 65</u>

### *Miscellaneous Payments :*

Cash paid for losses which occurred before 1886.....	\$8.00
“ “ “ “ “ during 1886.....	1,604.45
“ “ rebate and returned premiums.....	2 58
“ “ safe .....	55 75
Total expenditure .....	<u>\$1,944 43</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual.....	990,876 00	990,876 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 . . . . .	615	877,046 00
“ new and renewed during 1886 . . . . .	191	285,510 00
Gross number during 1886 . . . . .	806	1,162,556 00
Less expired or cancelled in 1886 . . . . .	121	171,680 00
Net risks in force on mutual system 31st December, 1886 . . . . .	685	990,876 00

## CLASSIFICATION OF RISKS.

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS.

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment . . . . .	14,205 00	14,205 96
Amount of all premium notes, after deducting all payments thereon and assessment levied . . . . .	8,525 82	8,525 82
Amount of premium notes received during the year 1886 . . . . .	5,710 20	5,710 20

## DOWNIE MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, ST. PAULS.

*Commenced business 21st April, 1884.**President*—JAMES BALLANTYNE.*Secretary*—PETER SMITH.

Unassessed premium note capital, \$14,145.53.

## ASSETS.

Cash on hand at head office.....	\$ 77 51
Amount of assessment levied during 1886 .....	5 31
“ premium notes in force, after deducting all payments thereon and assessments levied.....	14,145 53
Total assets .....	<u>\$14,228 35</u>

## LIABILITIES—None.

## RECEIPTS.

Cash received for fees at taking of applications .....	\$118 50
“ assessments levied during 1886 .....	590 47
“ “ prior to 1886 .....	10 21
“ interest .....	79
“ borrowed money .....	500 00
Total receipts .....	<u>\$1,219 97</u>

## EXPENDITURE.

*Expenses of Management:*

Amount paid for fees on application .....	\$98 40
“ fuel and light .....	5 00
“ interest.....	20 00
“ statutory assessment .....	9 23
“ auditors' fees for 1885.....	3 00
“ printing, stationery and advertising .....	7 13
“ postage, telegrams and express, etc. ....	6 55
“ levying and collecting assessments.....	11 00
“ registering resolutions, etc.....	25
Total expenses of management.....	<u>\$160 56</u>
Amount paid for loss incurred in 1886 .....	530 00
“ repaid for loan.....	500 00
Total expenditure .....	<u>\$1,190 56</u>

CURRENCY OF RISKS.

Amount covered by Policies in force 31st December, 1886.

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual.....	461,680 00	461,680 00

MOVEMENT IN RISKS.

Mutual System.

	Number.	Amount.
		\$ c.
Policies in force December 31st, 1885.....	213	323,905 00
“ taken during 1886.....	79	148,915 00
Gross number during 1886.....	292	472,820 00
Less expired and cancelled in 1886.....	9	11,140 00
Net risks in force on mutual system 31st December, 1886.....	283	461,680 00

CLASSIFICATION OF RISKS :

Isolated and Non-hazardous.

PREMIUM NOTES OR UNDERTAKINGS.

	Five years.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by the Company, and legally liable to assessment.....	14,820 09	14,820 09
Amount of all premium notes on Policies in force December 31st, 1886, after deducting all payments thereon, and assessments levied.....	14,145 53	14,145 53
Amount of premium notes received during the year 1886.....	7,475 75	7,475 75



# NORTH DUMFRIES AND SOUTH WATERLOO FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, AYR.

*Commenced business 15th May, 1856.**President*—S. HALL.*Secretary*—WM. DEANS.

Unassessed premium note capital, \$167,246.25.

## ASSETS.

Cash on hand at head office . . . . .	\$473 75
Amount unpaid of assessments levied during 1886 . . . . .	486 12
“ of assessments levied before 1886 (not extended) . . . . . \$151 38	
“ of premium notes in force, after deducting all payments thereon and assessments levied . . . . .	167,246 25
Total assets . . . . .	<u>\$168,206 12</u>

LIABILITIES—None.

## RECEIPTS.

Cash received for assessments levied in 1886 . . . . .	\$2,183 73
“ received in years prior to 1886 . . . . .	747 42
Total receipts . . . . .	<u>\$2,931 15</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for statutory assessment or certificate . . . . .	\$100 79
“ “ printing, stationery and advertising . . . . .	92 50
“ “ rent and taxes . . . . .	67 80
“ “ salaries, directors' and auditors' fees . . . . .	650 45
“ “ postage, telegrams and express . . . . .	42 10
“ “ investigation and adjustment of claims . . . . .	8 40
“ “ solicitors' fees . . . . .	11 00
Total expenses of management . . . . .	<u>\$973 04</u>

*Miscellaneous Payments :*

Cash paid for losses that occurred during 1886 . . . . .	\$1,213 00
“ “ “ prior to 1886 . . . . .	110 00
“ Treasurer for amount due him 31st Dec., 1885 . . . . .	145 36
“ for incidentals . . . . .	16 00
Total expenditure . . . . .	<u>\$2,457 40</u>

CURRENCY OF RISKS.

Amount covered by Policies in force 31st December, 1886.

SYSTEM.	Five years.	Total
	§ c.	§ c.
Mutual.....	3,670,976 00	3,670,976 00

MOVEMENT IN RISKS.

Mutual System.

	Number.	Amount.
		§ c.
Policies in force 31st December, 1885.....	1,558	3,535,667 00
Policies new and renewed during 1886 .....	357	812,800 00
Gross number during 1886 .....	1,915	4,348,467 00
Less expired and cancelled in 1886.....	332	677,491 00
Net risks in force on Mutual system, 31st December, 1886.....	1,583	3,670,976 00

CLASSIFICATION OF RISKS :

Farm and Non-hazardous.

PREMIUM NOTES OR UNDERTAKINGS

On Policies in force 31st December, 1886.

	Five year risks.	Total.
	§ c.	§ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	180,935 55	180,935 55
Amount of all premium notes, after deducting all payments thereon and assessments levied.....	167,246 25	167,246 25
Amount of premium notes received during the year 1886.....	34,354 25	34,354 25

## DUNWICH FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, WALLACETOWN.

*Commenced business September, 1880.**President*—PETER STALKER.*Secretary*—JOHN L. PEARCE.

Unassessed premium note capital. \$11,524.29.

## ASSETS.

Amount unpaid of assessments levied prior to 1886 (not extended). \$66 50	
Amount of unassessed premium note capital .....	\$11,524 29
Total .....	<u>\$11,524 29</u>

## LIABILITIES.

Amount of money borrowed .....	\$110 75
Amount due Treasurer .....	99 33
Total liabilities .....	<u>\$210 08</u>

## RECEIPTS.

Amount of cash received for fees and surveys .....	\$69 50
“ “ assessments levied prior to 1886 .....	73 07
“ “ interest .....	4 42
Total income .....	<u>\$146 99</u>

## EXPENDITURE.

*Expenses of Management:*

Amount paid for interest .....	\$21 33
“ statutory assessment .....	15 32
“ printing, stationery and advertising .....	19 43
“ salaries, directors' and auditors' fees .....	112 00
“ sundries .....	7 60
Total expenses of management .....	<u>\$175 68</u>
Cash paid for losses which occurred during 1886 .....	37 60
Repayment of loans .....	200 00
Total expenditure .....	<u>\$413 28</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	[Total.
	\$ c.	\$ c.
Mutual.....	554,026 00	554,026 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	488	522,441 00
“ taken during 1886 (new and renewed) .....	145	156,650 00
Gross number during 1886.....	633	679,091 00
Deduct expired and cancelled in 1886 .....	136	125,065 00
Net risks in force 31st December, 1886 .....	497	554,026 00

## CLASSIFICATION OF RISKS :

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	16,977 34	16,977 34
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	11,524 29	11,524 29
Amount of premium notes received during the year 1886 .....	3,916 31	3,916 31

## SOUTH EASTHOPE FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, TAVISTOCK.

*Commenced business 28th December, 1871.**President*—WERNER YOUNGBLUT.*Secretary*—ROBERT REID.

Unassessed premium note capital, \$73,166.77.

## ASSETS.

Actual cash on hand at head office.....	\$ 45 61
Cash on deposit to Company's credit in Bank of Commerce, Stratford....	3 62
Amount of premium notes in force, after deducting all payments thereon and assessments levied.....	73,166 77
Total assets .....	<u>\$73,216 00</u>

## LIABILITIES—None.

## RECEIPTS.

Cash at head office, as at last statement (not extended) .....	\$20 61
Cash received for sale of old safe.....	\$ 50 00
“ interest .....	12 00
“ securities .....	421 38
Total receipts .....	<u>\$483 38</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for salaries, directors' and auditors' fees .....	\$ 82 00
“ adjusting claim .....	4 50
“ statutory assessment.....	41 38
“ printing, stationery and advertising.....	47 60
“ postage, telegrams and express .....	18 00
“ attending convention.....	15 00
“ rent and taxes.....	5 00
“ safe, etc .....	133 00
“ registering resolutions and association fees.....	3 90
Expenses of management .....	<u>\$350 38</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886.....	\$ 83 00
Investment .....	25 00
Total expenditure .....	<u>\$458 38</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual.....	1,553,830 00	1,553,830 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	848	1,451,400 00
"    new and renewed during 1886 .....	201	407,780 00
Gross number during 1886 .....	1,049	1,859,180 00
Less expired and cancelled in 1886.....	189	305,350 00
Net risks in force on mutual system 31st December, 1886.....	860	1,553,830 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force December 31st, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by the Company, and legally liable to assessment .....	77,691 50	77,691 50
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	73,166 77	73,166 77
Amount of premium notes received during the year 1886.....	20,389 00	20,389 00



## ECONOMICAL MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, BERLIN.

*Commenced business 28th October, 1871.**President*—HUGO KRANZ, M.P.*Secretary*—WM. OELSCHLAGER.

Unassessed premium note capital, \$154,597.

## ASSETS.

Cash on hand at Head Office.....	43
Cash on deposit to Company's credit in Canadian Bank of Commerce....	\$31,571 99
Cash in Agents' hands, acknowledged by them to be due, and considered good .....	405 05
Amount unpaid of assessments levied during 1886.....	1,931 68
“ “ “ in prior years (not extended). \$643 62	
Amount of short date notes, or due bills, less than one year overdue.....	642 84
“ premium notes in force after deducting all payments thereon and assessments levied .....	\$154,597 00
Less premium notes given for reinsurance.....	1,567 00
	<hr/> 153,030 00
Amount of interest due and accrued .....	730 27
Total assets .....	<hr/> <u>\$188,312 26</u>

## LIABILITIES.

Amount of loss adjusted.. ..	\$600 00
“ “ reported.....	400 00
Total liabilities.....	<hr/> <u>\$1,000 00</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$28,519 83
Cash received as first payments, being part payment of premium notes....	\$10,913 40
“ for assessments levied in 1886 .....	12,921 38
“ for assessments levied in years prior to 1886 .....	2,328 51
“ for interest.....	1,550 14
“ for transfer fees.....	89 00
Total receipts.....	<hr/> <u>\$27,802 43</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents .....	\$1,602 00
“ statutory assessment .....	92 59
“ printing, stationery and advertising .....	448 68
“ salaries, directors' and auditors' fees .....	2,488 00
“ postage, telegrams and express .....	243 23
“ fuel and light .....	45 05
“ rent and taxes .....	72 00
“ travelling expenses .....	480 58
“ other expenses .....	306 88

Expenses of Management..... \$5,779 01

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	\$18,630 20
“ reinsurances .....	152 12
“ rebate, abatement and returned premiums .....	188 51

Total expenditure ..... \$24,749 84

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual .....	3,753,111 00	3,753,111 00
Reinsured .....	20,650 00	20,650 00
Net risks actually carried by Company .....	3,732,461 00	3,732,461 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	3245	3,248,005 00
“ new and renewed during 1886 .....	1538	1,519,302 00
Gross number during 1886 .....	4783	4,767,307 00
Less expired and cancelled in 1886 .....	976	1,014,196 00
Net risks in force on mutual system 31st December, 1886 .....	3807	3,753,111 00

## BUSINESS TRANSACTED:

General Fire Insurance.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force December 31st, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	193,246 00	193,246 00
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	154,597 00	154,597 00
Amount of premium notes received during the year 1886.....	80,490 00	80,490 00
Residue of premium notes given for reinsurance .....	1,567 00	1,567 00

## ELMA FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, ATTWOOD.

*Commenced business 22nd March, 1884.**President*—W. SHEARER.*Secretary*—ROBT. CLELAND.

Unassessed premium note capital, \$17,646.19.

## ASSETS.

Amount unpaid of assessments levied in 1886 .....	\$64 37
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	17,646 19
Total assets .....	<u>\$17,710 56</u>

## LIABILITIES.

Due Treasurer .....	\$52 34
Total liabilities .....	<u>\$52 34</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$35 35
Cash received for fees at taking of application .....	\$26 00
“ assessments levied in 1886 .....	730 22
“ assessments levied in years prior to 1886 .....	18 15
Over-draft on Secretary-Treasurer .....	52 34
Total receipts .....	<u>\$826 71</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for statutory assessment .....	\$7 91
“ printing and stationery .....	19 25
“ salaries .....	102 00
“ postage and telegram .....	2 90
“ recording minutes .....	1 00
“ rent .....	4 00
Total expenses of management .....	<u>\$137 06</u>
Amount paid for losses which occurred prior to 1886 .....	725 00
Total expenditure .....	<u>\$862 06</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual.....	372,011 00	372,011 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force December 31st, 1885.....	208	276,308 00
Policies taken during 1886 .....	76	109,343 00
Gross number in force on mutual system, 31st December, 1886.....	284	385,651 00
Less expired and cancelled in 1886.....	10	13,640 00
Net risks in force December 31st, 1886 .....	274	372,011 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	18,606 05	18,606 05
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	17,646 19	17,646 19
Amount of premium notes received during the year 1886.....	5,467 15	5,467 15

## ERAMOSA MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, ROCKWOOD.

*Commenced business 9th April, 1861.**President*—DAVID REA.*Secretary*—HUGH BLACK.

Unassessed premium note capital, \$13,041.87.

## ASSETS.

Actual cash in hand at head office .....	\$ 397 74	
Cash on deposit to the Company's credit, not drawn against, in the Canadian Bank of Commerce, Guelph .....	2,184 89	
Cash on deposit to the Company's credit, not drawn against, in the Central Bank, Guelph .....	600 35	
		<hr/>
		\$3,182 98
Amount unpaid of assessments levied during 1886 .....		123 30
“ of premium notes in force, after deducting all payments therein and assessments levied .....		13,041 87
		<hr/>
Total assets .....		\$16,348 15

LIABILITIES.—None.

## RECEIPTS.

Cash on hand as per last statement (not extended) .....	\$443 79	
Cash received for fees or surveys .....		
Cash received as first payments, being part payment of premium notes .....	\$ 153 26	
Cash received for assessments levied in 1886 .....	138 98	
“ “ “ years prior to 1886 .....	81 19	
“ for interest .....	112 64	
“ for sundries .....	2 00	
		<hr/>
Total receipts .....		\$488 07

## EXPENDITURE.

*Expenses of Management :*

Amount paid for statutory assessment .....	\$ 10 79	
“ “ printing .....	10 80	
“ “ salaries .....	63 00	
“ “ postage, etc .....	7 72	
“ “ rent and taxes .....	4 00	
“ “ President and Secretary's expenses <i>re</i> Ins. Convention .....	20 00	
		<hr/>
Total expenses of management .....	\$116 31	
Amount paid for losses which occurred during 1886 .....	5 00	
		<hr/>
Total expenditure .....	\$121 31	



CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual. ....	396,760 00	396,760 00

MOVEMENT OF RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	195	378,660
“ new and renewed during 1886.....	81	116,375
Gross number during 1886.....	276	495,035
Less expired and cancelled in 1886.....	72	98,275
Net risks in force on mutual system 31st December, 1886.....	204	396,760

CLASSIFICATION OF RISKS:

Isolated and Non-hazardous.

PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	14,791 50	14,791 50
Amount of premium notes, after deducting all payments thereon and assessments levied.....	13,041 87	13,041 87
Amount of premium notes received during the year 1886.....	5,317 50	5,317 50

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 ERIE FARMERS' MUTUAL FIRE INSURANCE COMPANY.
 

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HEAD OFFICE, SELKIRK.

*Commenced business 2nd September, 1871.**President*—GUY CULVER.*Secretary*—J. W. HOLMES.

Unassessed premium note capital, \$13,521.52.

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 ASSETS.

Actual cash on hand at head office.....	\$101 09
Amount unpaid of assessments levied during 1886.....	60 31
“ short date notes, or due bills, less than one year overdue.....	205 00
“ premium notes in force, after deducting all payments thereon and assessments levied.....	13,521 52
Total assets .....	<u>\$13,887 92</u>

LIABILITIES.—None.

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 RECEIPTS.

Cash as per last statement (not extended).....	\$245 11
“ at taking of applications.....	\$88 35
“ received as first payments, being part payment of premium notes at head office.....	175 28
“ “ for assessments levied in 1886.....	678 09
“ “ “ prior years.....	34 71
“ “ sundries .....	5 00
Total receipts.....	<u>\$981 43</u>

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 EXPENDITURE.
*Expenses of Management :*

Amount paid for commission and fees.....	\$88 40
“ statutory assessment .....	17 31
“ printing, stationery and advertising .....	11 85
“ salaries, directors' and auditors' fees.....	165 90
“ postage, telegrams and express.....	4 39
“ travelling expenses.....	4 50
“ fuel and rent.....	3 50
Total expenses of management.....	<u>\$295 85</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886.....	13 06
“ “ “ prior to 1886 .....	700 00
Total expenditure .....	<u>\$1,008 85</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st Dec., 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual.....	635,805 00	635,895 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	566	607,235 00
“ new and renewed during 1886.....	136	170,620 00
Gross number during 1886.....	702	777,855 00
Less expired and cancelled in 1886 .....	119	142,050 00
Net risks in force 31st December, 1886.....	583	635,805 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st Dec., 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company and legally liable to assessment.....	15,405 30	15,405 30
Amount of all premium notes, after deducting all payments thereon and assessments levied.....	13,521 52	13,521 52
Amount of premium notes received during the year 1886 ....	4,367 25	4,367 25

## FORMOSA MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, FORMOSA.

*Commenced business 22nd May, 1880.**President*—ANDREW WAECHTER.*Secretary*—JULIUS NOLL.

Unassessed premium note capital, \$19,044.82.

## ASSETS.

Amount of cash on hand at head office .....	\$1,080 95
“ unpaid assessments which were levied during 1886.....	27 32
“ premium notes in force, after deducting all payments thereon and assessments levied .....	19,044 82
Amount of unpaid notes, or due bills, less than one year overdue.....	106 10
Total assets.....	<u>\$20,259 19</u>

LIABILITIES.—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$546.60
Cash received as first payments, being part payment of premium notes....	\$259 94
“ for assessments levied in 1886.....	350 20
“ “ “ before 1886 .....	7 00
“ for interest.....	41 19
Cash from sundries, agents' balances.....	149 88
Total receipts .....	<u>\$808 21</u>

## EXPENDITURE.

*Expenses of Management :*

Commission to agents .....	\$103 00
Amount paid for statutory assessment or certificate .....	12 61
“ salaries .....	127 15
“ postage, telegrams and express .....	5 55
“ investigation of claims .....	2 00
“ printing and stationery .....	23 55
Total expenditure.....	<u>\$273 86</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual.....	642,792 000	642,792 000

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	418	442,515 00
“ new and renewed during 1886 .....	280	293,462 00
Gross number during 1886 .....	698	735,977 00
Less expired and cancelled in 1886 .....	77	93,185 00
Net risks in force 31st December, 1886 .....	621	642,792 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES AND UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	20,237 00	20,237 00
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	19,044 82	19,044 82
Amount of premium notes received during the year 1886.....	9,092 00	9,092 00

## GERMANIA FARMERS' MUTUAL FIRE INSURANCE COMPANY

HEAD OFFICE, LOT 4, CONCESSION 8, TOWNSHIP OF NORMANDY.

*Commenced business 16th March, 1878.**President*—JNO. ROEDDING.*Secretary*—GEO. HOPF.

Unassessed premium note capital, \$18,329.86.

## ASSETS.

Actual cash on hand at head office .....	\$ 4 20
Amount unpaid of assessments levied before 1886 (not extended)..	\$2 00
Amount of premium notes in force after deducting all payments thereon and assessments levied .....	18,329 86
Total assets .....	<u>\$18,334 06</u>

## LIABILITIES—None.

## RECEIPTS.

Cash at head office as per last statement (not extended) .....	\$41 10
Cash received for membership fees (not being part payment of premium notes) .....	\$45 00
Cash received for assessments levied in years prior to 1886 .....	1 50
Total receipts .....	<u>\$46 50</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for law costs .....	\$ 7 35
“ statutory assessment or certificate .....	19 97
“ printing, stationery and advertising .....	33 15
“ rent and taxes .....	1 00
“ salaries, directors' and auditors' fees .....	9 00
“ travelling expenses .....	8 00
“ postage, telegrams and express .....	2 70
“ other expenses .....	2 23
Total expenditure .....	<u>\$83 40</u>



## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual .....	771,345 00	771,345 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	555	710,470 00
“ new and renewed during 1886.....	134	156,650 00
Gross number during 1886.....	689	867,120 00
Less expired and cancelled in 1886.....	79	95,775 00
Net risks in force on mutual system 31st December, 1886. ....	610	771,345 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	19,639 50	19,639 50
Amount of all premium notes after deducting all payments thereon and assessments levied.....	18,329 86	18,329 86
Amount of premium notes received during the year 1886.....	3,867 75	3,867 75

## THE GLOBE MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, BRANTFORD.

*Commenced business 5th November, 1873.**President*—JOHN STRICKLAND.*Secretary*—EDWIN SIMS.

Unassessed premium note capital, \$10,937.28.

## ASSETS.

Actual cash on hand at head office .....	\$136 68	
		\$136 68
Amount of unpaid assessments levied during 1886 .....		1,913 09
“ “ “ before 1885, not extended .....	\$1,477 78	
“ notes or due bills less than one year overdue .....		64 48
“ premium notes in force, after deducting all payments thereon and assessments levied .....		10,937 28
Total assets .....		<u>\$13,051 53</u>

## LIABILITIES.

Amount of losses reported .....	\$1,340 00
“ due directors .....	211 40
“ of money borrowed .....	1,200 00
Total liabilities .....	<u>\$2,751 40</u>

## RECEIPTS.

Cash on hand, as per last statement, not extended .....	\$644 26
Cash received as first payments, being part payment of premium notes....	\$1,116 38
“ for assessments levied in 1886 .....	1,635 98
“ “ years prior to 1886 .....	218 91
“ transfer fees, etc. ....	72 94
“ interest .....	54 77
“ from securities .....	1,700 00
Amount of cash borrowed .....	1,200 00
Total receipts .....	<u>\$5,998 98</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents.....	\$477 39
“ statutory assessment .....	22 13
“ printing, stationery and advertising.....	28 34
“ salaries, directors' and auditors' fees .....	615 87
“ postage, telegrams and express.....	33 07
“ travelling expenses.....	12 25
Expenses of management .....	<u>\$1,189 05</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	\$4,717 38
“ “ “ prior to 1886 .....	540 33
“ probate, abatement, and returned premiums.....	59 80
Total expenditure .....	<u>\$6,506 56</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Three years.	Total.
	\$ c.	\$ c.	\$ c.
Mutual .....	12,900 00	752,378 00	765,278 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Total.
		\$ c.
Policies in force 31st December, 1885.....	12,271	776,341 00
New and renewed during 1886 .....	413	257,775 00
Gross number during 1886.....	1,640	1,034,116 00
Less expired and cancelled in 1886 .....	408	268,838 00
Net risks in force 31st December, 1886 .....	1,232	765,278 00

BUSINESS TRANSACTED:

Mercantile and Non-hazardous.

PREMIUM NOTES OR UNDERTAKINGS

*On policies in force 31st December, 1886.*

	One year risks.	Three year risks.	Total.
	£ c.	£ c.	£ c.
Amount of face of all premium notes held by Company and legally liable to assessment . . . . .	653 03	18,224 44	18,877 47
Amount of all premium notes, after deducting all payment thereon and amounts levied . . . . .	298 03	10,639 25	10,937 28
Amount of premium notes received during the year 1886 . . . . .	323 27	5,857 84	6,181 11

## THE GRAND RIVER FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, YORK.

*Business commenced 15th April, 1875.**President*—DAVID LINDSAY.*Secretary*—F. A. NELLES.

Unassessed premium note capital, \$5,595.99.

## ASSETS.

Cash on deposit to the Company's credit, not drawn against, in Hamilton Bank Agency, Cayuga .....	\$627 44
Cash in agents' hands, acknowledged by them to be due, and considered good. ....	60 50
Amount of unpaid assessments levied before 1886 (not extended) \$60 12	
Amount of premium notes in force after deducting all payments thereon and assessments levied .....	5,595 99
Amount of unpaid licenses. ....	7 00
Total assets .....	<u>\$6,290 93</u>

## LIABILITIES—None.

## RECEIPTS.

Cash at head office and in bank, as per last statement (not extended) \$61 35	.
Cash received at taking of applications .....	\$42 00
“ for assessments levied in years prior to 1886 .....	169 32
“ for sale of licenses .....	6 00
“ for interest .....	20 21
Total receipts .....	<u>\$237 53</u>

## EXPENDITURE.

*Expenses of Management:*

Amount paid for statutory assessment .....	\$11 80
“ printing and advertising .....	16 50
“ salaries, directors' and auditors' fees .....	180 30
“ travelling expenses .....	5 00
“ postage, telegrams, express and stationery .....	5 34
“ incidental expenses .....	2 50

Total expenditure .....

\$221 44

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual .....	412,535 00	412,535 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	310	413,910 00
“ new and renewed during 1886 .....	135	202,110 00
Gross number during 1886.....	445	616,020 00
Less expired and cancelled in 1886.....	138	203,485 00
Net risks in force on mutual system 31st December, 1886.....	307	412,535 00

## CLASSIFICATION OF RISKS:

All Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	6,257 75	6,257 75
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	5,595 99	5,595 99
Amount of premium notes received during the year 1886.....	3,049 20	3,049 20



## GREY AND BRUCE MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, HANOVER.

*Commenced business 6th July. 1878.**President*—DAVID McNICOL.*Secretary*—DUNCAN CAMPBELL.

Unassessed premium note capital, \$13,233.42.

## ASSETS.

Cash on deposit to the Company's credit, not drawn against, in the Central Bank agency at Durham .....	\$2,439 75
Amount unpaid of assessments of 1886 .....	136 23
Amount of premium notes in force after deducting all payments thereon and assessments levied .....	13,233 42
<b>Total assets .....</b>	<b>\$15,809 40</b>

LIABILITIES.—None.

## RECEIPTS.

Cash received for assessments levied of 1886 .....	\$534 86
“ “ “ years prior to 1886 .....	367 38
“ interest .....	75 60
<b>Total receipts .....</b>	<b>\$977 84</b>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for investigation and adjustment of claims .....	\$5 12
“ salaries, directors' and auditors' fees .....	151 16
“ statutory assessment .....	19 08
“ postage, stationery and printing .....	60 95
“ removing safe .....	10 00
<b>Expenses of management .....</b>	<b>\$246 31</b>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	127 80
<b>Total expenditure .....</b>	<b>\$374 11</b>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year.	Two years.	Three years.	Four years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Mutual .....	1,617 00	11,775 00	352,563 00	7,300 00	314,356 00	687,611 00

## MOVEMENT OF RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	631	669,329 00
“ new and renewed during 1886 .....	171	153,472 00
Gross number during 1886 .....	802	822,801 00
Less expired and cancelled in 1886.....	149	135,190 00
Net risks in force 31st December, 1886.....	653	687,611 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	One year risk.	Two year risks.	Three year risks.	Four year risks.	Five year risks.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....						15,942 00
Amount of all premium notes, after deducting all payments thereon and assessments levied..	11 35	92 29	5,764 55	222 45	7,142 78	13,233 42
Amount of premium notes received during the year 1886.....	12 00	79 68	2,178 26			2,269 94

## GUELPH TOWNSHIP MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, GUELPH TOWNSHIP, LOT 6, CON. 1, DIV. B.

*Commenced business 16th February, 1886.**President*—JOHN HOBSON.*Secretary*—WM. WHITELAW.

Unassessed premium note capital, \$20,109.32.

## ASSETS.

Actual cash on hand at head office . . . . .	\$ 18 45	
“ in Bank of Commerce, Guelph . . . . .	760 60	
		<hr/>
		\$779 05
Amount of premium notes in force after deducting all payments thereon and assessments levied . . . . .		20,109 32
		<hr/>
Total assets . . . . .		<u>\$20,888 37</u>

## LIABILITIES.—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended) . . . . .	\$598 91	
Cash received as first payments, being part payment of premium notes . .		\$254 23
“ for interest during 1886 . . . . .		35 60
		<hr/>
Total receipts . . . . .		<u>\$289 83</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for statutory assessment or certificate . . . . .	\$ 13 09
“ printing, stationery and advertising . . . . .	14 70
“ salaries, directors' and auditors' fees . . . . .	49 00
“ postage and stationery . . . . .	4 60
“ travelling expenses . . . . .	5 00
	<hr/>
Expenses of management . . . . .	<u>\$ 86 39</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 . . . . .	22 10
“ rebate or returned premium . . . . .	1 20
	<hr/>
Total expenditure . . . . .	<u>\$109 69</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual.....	479,790 00	479,790 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	264	459,340 00
“ new and renewed during 1886 .....	87	170,600 00
Gross number and amount during 1886.....	351	629,940 00
Less expired and cancelled in 1886.....	80	150,150 00
Net risks in force 31st December, 1886 .....	271	479,790 00

## CLASSIFICATION OF RISKS :

Farm and non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	22,100 50	22,100 50
Amount of premium notes, after deducting all payments thereon and assessments levied .....	20,109 32	20,109 32
Amount of premium notes received during the year 1886 .....	8,115 50	8,115 50

## HAY TOWNSHIP FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, ZURICH.

*Commenced business 3rd February, 1875.**President*—PETER DOUGLAS.*Secretary*—HENRY EILBER.

Unassessed premium note capital, \$49,339.14

## ASSETS.

Cash on hand at Head Office .....	\$428 86
Amount of unpaid assessments levied before 1886 (not extended).. \$18 85	
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	49,339 14
Total assets .....	<u>\$49,768 00</u>

## LIABILITIES.

Amount of adjusted losses .....	\$1,254 00
Total liabilities .....	<u>\$1,254 00</u>

## RECEIPTS.

Cash at Head Office, as per last statement (not extended)....	\$1,512 81
Cash received as first payments, being part payment of premium notes....	\$240 45
“ for interest .....	30 40
Total receipts .....	<u>\$270 85</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for statutory assessment .....	\$47 60
“ printing, stationery and advertising .....	15 75
“ salaries, directors' and auditors' fees .....	161 85
“ travelling expenses .....	23 20
“ postage, telegrams and express .....	23 40
“ investigation and adjustment of claims .....	32 10
“ other expenses .....	4 30
Expenses of management .....	<u>\$308 20</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	\$1,046 60
Total expenditure .....	<u>\$1,354 80</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual System .....	1,821,202 00	1,821,202 00

## MOVEMENT OF RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	1,289	1,669,787 00
“ new and renewed during 1886 .....	361	486,965 00
Gross number during 1886.....	1,650	2,156,752 00
Less expired and cancelled in 1886.....	289	335,550 00
Net risks in force on Mutual system, 31st December, 1886 .	1,361	1,821,202 00

## CLASSIFICATION OF RISKS:

Isolated and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company and legally liable to assessment.....	51,176 31	51,176 31
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	49,339 14	49,339 14
Amount of premium notes received during the year 1886 .....	14,086 50	14,086 50



## HOPEWELL CREEK MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, NEW GERMANY.

*Commenced business 3rd March, 1880.**President*—JOSEPH SPRINGER.*Secretary*—ANTON FRANK.

Unassessed premium note capital, \$51,927.66.

## ASSETS.

Actual cash in hand at head office .....	\$132 89	
Deposit in Bank of Commerce, Berlin .....	600 00	\$732 89
Amount unpaid of assessments levied in 1886 .....		166 77
“ of premium notes in force, after deducting all payments thereon and assessments levied .....		51,927 66
Total assets .....		<u>\$52,827 32</u>

## LIABILITIES—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$41 73	
Cash received as first payments, being part payment of premium notes ....		\$8 25
“ for assessments levied in 1886 .....		1,594 18
“ for assessments levied in years prior to 1886 .....		90 64
“ for money borrowed .....		530 00
“ for transfer fees .....		4 50
Total receipts .....		<u>\$2,227 57</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for investigation and adjustment of claims .....	\$9 00
“ printing .....	69 43
“ salaries, directors' and auditors' fees .....	173 00
“ statutory assessment .....	24 05
“ travelling expenses .....	4 00
“ postage, etc. ....	35 35
“ commission .....	42 75
“ interest .....	24 43
“ incidentals .....	5 40
Expenses of management .....	<u>\$387 41</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	\$619 00
“ repayment of loans .....	530 00
Total expenditure .....	<u>\$1,536 41</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual .....	981,809 00	981,809 00

## MOVEMENT IN RISKS.

*Mutual System*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	786	843,749 00
"    new and renewed during 1886 .....	322	367,330 00
Gross number during 1886.....	1108	1,211,079 00
Less expired and cancelled in 1886.....	232	229,270 00
Net risks in force on mutual system, 31st December, 1886.....	876	981,809 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company and legally liable to assessment .....	57,580 00	57,580 00
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	51,927 66	51,927 66
Amount of premium notes during the year 1886 .....	19,915 10	19,915 10

## HOWICK FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, GORRIE.

*Commenced business 10th July, 1873.**President*—JAMES EDGAR.*Secretary*—T. F. MILLER.

Unassessed premium note capital, \$133,931.51.

## ASSETS.

Actual cash on hand at head office and in private bank.....	\$1,722 98
Amount unpaid of assessments levied during 1886.....	515 87
“ “ “ in prior years (not extended). \$503 52	
“ of premium notes in force, after deducting all payments thereon and assessments levied .....	133,931 51
Total assets .....	<u>\$136,170 36</u>

## LIABILITIES.

Amount of losses reported.....	\$600 00
Total liabilities .....	<u>\$600 00</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$1,357 45
Cash received for assessments levied in 1886 .....	\$4,096 09
“ “ “ years prior to 1886.....	589 05
Cash borrowed.....	1,134 50
Cash received from interest .....	16 42
“ “ steam thresher permits.....	5 22
Total receipts .....	<u>\$5,841 28</u>

## EXPENDITURE.

*Expenses of Management:*

Amount paid to agents for commission.....	\$126 00
“ for investigation and adjustment of claims.....	69 70
“ statutory assessment .....	82 48
“ printing, stationery and advertising.....	89 00
“ rent and taxes. ....	7 50
“ salaries, directors' and auditors' fees .....	723 90
“ interest .....	28 00
“ postage, telegrams and express.....	51 65
“ other expenses .....	19 27
Expenses of management .....	<u>\$1,197 50</u>

*Miscellaneous Payments:*

Cash paid for losses which occurred during 1886 .....	3,143 75
“ repayment of loans.....	1,134 50
Total expenditure .....	<u>\$5,475 75</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	§ c.	§ c.
Mutual . . . . .	3,068,897 00	3,068,897 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		§ c.
Policies in force 31st December, 1885. . . . .	2,201	2,893,268 00
“ new and renewed during 1886 . . . . .	392	555,797 00
Gross number during 1886. . . . .	2,593	3,449,065 00
Less expired and cancelled in 1886. . . . .	287	380,168 00
Net risks in force on mutual system 31st December, 1886 . . . . .	2,306	3,068,897 00

## CLASSIFICATION OF RISKS :

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	§ c.	§ c.
Amount of face of all premium notes held by Company, and legally liable to assessment . . . . .	155,474 85	155,474 85
Amount of all premium notes, after deducting all payments thereon and assessments levied . . . . .	133,931 51	133,931 51
Amount of premium notes received during the year 1886. . . . .	28,239 75	28,239 75

## THE HURON AND MIDDLESEX MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, LONDON.

*Commenced business 17th December, 1878.**President*—L. C. LEONARD.*Secretary*—JOHN STEPHENSON.

Unassessed premium note capital, \$48,804.66.

## ASSETS.

Amount of mortgage.....	\$755 70
Actual cash on hand at head office.....	\$101 18
“ in Bank of London.....	113 31
	<hr/> 214 49
Cash in agents' hands, acknowledged by them to be due and considered good .....	1,268 66
Amount unpaid of assessments levied during 1886.....	2,125 25
“ “ “ before 1886 (not extended) \$1,737 25	
Amount of short date notes, or due bills, less than one year overdue .....	1,613 15
“ premium notes in force, after deducting all payments thereon and assessments levied.....	\$48,804 66
“ less residue of premium notes given for reinsurance.....	628 88
	<hr/> 48,175 78
“ accrued interest on mortgage.....	34 00
Total assets.....	<hr/> <hr/> \$54,187 03

## LIABILITIES.

Amount of losses adjusted.....	\$3,808 58
“ loans from banks and other sources.....	1,550 00
“ salaries and printing.....	572 69
Total liabilities .....	<hr/> \$5,931 27

## CASH RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$1,202 74
Cash received at taking of applications.....	\$74 98
“ as first payments, being part payment of premium notes....	12,063 14
“ for assessments levied in 1886.....	5,629 49
“ “ “ in prior years.....	736 40
<i>Carried forward</i> .....	<hr/> \$18,504 01

<i>Brought forward</i> .....	\$18,504 01
Cash received for interest.....	87 65
“ from transfers and extra premiums.....	94 35
“ from re-insurance.....	260 00
“ for rent.....	36 00
“ from loan.....	310 00
Total receipts.....	<u>\$19,292 01</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents .....	\$2,109 41
“ “ fuel and light .....	15 03
“ “ investigation and adjustment of claim.....	187 00
“ “ interest.....	101 49
“ “ statutory assessment.....	53 63
“ “ printing, stationery and advertising.....	527 89
“ “ rent and taxes.....	204 00
“ “ salaries, directors' and auditors' fees .....	3,018 71
“ “ travelling expenses.....	593 19
“ “ postage, telegrams and express.....	196 70
“ “ law costs.....	194 63
“ “ mercantile agency.....	60 00
“ “ incidental expenses .....	60 51
Expenses of management.....	<u>\$7,322 19</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred prior to 1886.....	\$2,535 64
“ “ “ “ during 1886.....	8,678 78
	<u>11,214 42</u>
“ “ reinsurance .....	285 95
“ “ returned premiums.....	702 00
Total expenditure.....	<u>\$19,524 56</u>



## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Three years.	Total.
	§ c.	§ c.	§ c.
Mutual .....	319,946 00	1,588,034 00	1,907,980 00
Reinsured .....		14,675 00	14,675 00
Net risks carried by Company 31st December, 1886. ....	319,946 00	1,573,359 00	1,893,305 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		§ c.
Policies in force 31st December, 1885. ....	2,746	1,881,207 00
“ new and renewed during 1886. ....	1,295	911,978 00
Gross number during 1886. ....	4,041	2,793,185 00
Less expired and cancelled in 1886. ....	1,279	885,205 00
Net risks in force 31st December, 1886 .....	2,762	1,907,980 00

## BUSINESS TRANSACTED :

General Fire Insurance.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	One year risks.	Three year risks.	Total.
	§ c.	§ c.	§ c.
Face of premium notes held by Company and legally liable to assessment. ....			79,183 73
Amount of all premium notes, December 31st, 1886, after deducting all payments thereon and assessments levied. ....			48,804 66
Amount of premium notes received during the year 1886. ....			36,529 79
Residue of premium notes given for reinsurance during the year 1886. ....		628 88	628 88

## THE LAMBTON FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, WATFORD.

*Commenced business 5th November, 1875.**President*—GEORGE DEWAR.

|

*Secretary*—W. G. WILLOUGHBY.

Unassessed premium note capital, \$25,012.20

## ASSETS.

Cash on hand .....	\$164 83	
“ deposit, to Company's credit, in Bank of London, Watford .....	6,470 75	
		\$6,635 58
Amount of short date notes, or due bills, less than one year overdue.....		965 20
“ “ “ “ one year or more overdue (not extended) .....	\$2 85	
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....		25,012 20
Total assets .....		<u>\$32,612 98</u>

## LIABILITIES—(None).

## RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$4,577 09	
Cash received as first payments, being part payment of premium notes ...		\$6,753 46
“ for interest .....		235 22
“ for debentures .....		2,100 00
“ for sundries .....		5 13
Total receipts.....		<u>\$9,093 81</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents .....	\$528 30
“ statutory assessment .....	72 12
“ printing, stationery and advertising.....	131 59
“ salaries, directors' and auditors' fees .....	481 00
“ postage, telegrams and express .....	92 86
“ travelling expenses .....	14 50
“ investigation on adjustment of claims .....	22 75
“ sundries .....	17 68
Total expenses of management.....	<u>\$1,360 80</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886.....	\$3,549 50
“ rebate .....	108 55
“ re-insurance .....	16 50
“ loan .....	2,000 00
Total expenditure.....	<u>\$7,035 55</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.		Total.	
	£	c.	£	c.
Mutual .....	2,787,971	00	2,787,971	00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		£ c.
Policies in force 31st December, 1885.....	2,300	2,511,757 00
“ new and renewed during 1886 .....	1,058	1,137,621 00
Gross number during 1886.....	3,358	3,649,378 00
Less expired and cancelled in 1886.....	780	861,407 00
Net risks 31st December, 1886 .....	2,578	2,787,971 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.		Total.	
	£	c.	£	c.
Amount of face of all premium notes held by Company and legally liable to assessment.....	41,762	00	41,762	00
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	25,012	20	25,012	20
Amount of premium notes received during the year 1886 .....	17,023	40	17,023	40

## LENNOX AND ADDINGTON MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, NAPANEE.

*Commenced business 17th August, 1876.**President*—J. B. AYLESWORTH.*Secretary*—CHARLES JAMES.

Unassessed premium note capital. \$4,674.89.

## ASSETS.

Actual cash on hand at head office .....	\$ 157 97
Amount unpaid of assessments levied during 1886 .....	237 65
“ “ “ in prior years (not extended). \$340 15	
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	4,674 89
Total assets .....	<u>\$5,070 51</u>

## LIABILITIES—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$924 48
Cash received for assessments levied in 1886 .....	\$728 84
“ “ “ years prior to 1886 .....	134 65
Cash borrowed .....	300 00
Total receipts .....	<u>\$1,162 89</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission .....	\$111 50
“ statutory assessment .....	14 68
“ printing, stationery and advertising .....	30 75
“ salaries, directors' and auditors' fees .....	323 85
“ postage .....	15 72
“ legal expenses .....	19 90
“ interest .....	70 50
“ incidentals .....	50

*Miscellaneous Payments :*

Cash paid for losses which occurred prior to 1886 .....	5 00
“ “ “ during 1886 .....	37 00
Payment of loans .....	1,300 00
Total expenditure .....	<u>\$1,929 40</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.		Total.	
	£	c.	£	c.
Mutual.....	365,521	00	365,521	00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.	
		£	c.
Policies in force 31st December, 1885.....	487	514,840	00
"    new and renewed during 1886.....	152	143,736	00
Gross number during 1886.....	639	658,576	00
Less expired and cancelled in 1886.....	223	293,055	00
Net risks in force on mutual system 31st December, 1886.....	416	365,521	00

## CLASSIFICATION OF RISKS:

Farm and non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	£ c.	£ c.
Amount of face of all premium notes held by Company and legally liable to assessment. ....	7,491 23	7,491 23
Amount of all premium notes, after deducting all payments thereon and assessments levied ... ..	4,674 89	4,674 89
Amount of premium notes received during the year 1886 .....	2,746 52	2,746 52

## LOMBO MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, COLDSTREAM.

*Commenced business 11th August, 1882.**President*—THOMAS T. TURNBULL. | *Secretary*—JACOB MARSH.

Unassessed premium note capital, \$13,145.86.

## ASSETS.

Cash on deposit to Company' credit, not drawn against, in Agricultural Savings Company at London .....	\$1,250 89	
Actual cash on hand at Head Office .....	105 64	
		<hr/>
		\$1,356 53
Amount unpaid of Assessments levied in 1886 .....		48 72
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....		13,145 86
		<hr/>
Total assets .....		<u>\$14,551 11</u>

LIABILITIES.—None.

## RECEIPTS.

Cash at Head Office, as per last statement, (not extended) ....	\$870 26	
Cash received as first payments, being part payment of premium notes ...		\$216 09
“ for assessments levied in 1886 .....		465 03
“ “ “ before 1886 .....		45 45
“ interest .....		40 89
“ transfer fee and carpenters' risks .....		8 75
		<hr/>
Total receipts .....		<u>\$776 21</u>

## EXPENDITURE.

*Expenses of Management:*

Amount paid for statutory assessment .....		\$ 9 00
“ printing and stationery .....		25 45
“ salary .....		75 00
“ agents' commission .....		53 00
“ investigation and adjustment of claims .....		5 00
“ sundries .....		4 63
		<hr/>
Expenses of management .....		\$172 08
Cash paid for losses which occurred during 1886 .....		113 00
“ rebate .....		4 86
		<hr/>
Total expenditure .....		<u>\$289 94</u>



## CURRENCY OF RISKS.

*Amount covered by policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Two years.	Three years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Mutual .....	4,100 00	500 00	354,670 00	359,270 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	244	315,889 00
“ taken during 1886, new and renewed .....	92	107,405 00
Gross number and amount during 1886 .....	336	422,744 00
Deduct expired and cancelled in 1886 .....	48	63,474 00
Net risks in force on mutual system, 31st December, 1886 .....	288	359,270 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	One year risk.	Two year risks.	Three year risks.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	164 00	20 00	15,727 46	15,911 46
Amount of all premium notes, after deducting all payments thereon and assessments levied .....			13,145 86	13,145 86
Amount of premium notes received during the year 1886 .....			4,292 20	4,292 20

## LONDON TOWNSHIP MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, ARVA.

*Commenced business May 21th, 1882.**President*—EDWARD ROBERTS.*Secretary*—ED. DANN.

Unassessed premium note capital, \$13,978.72.

## ASSETS.

Cash in Royal Standard Loan Company, London.....	\$400 00
Amount unpaid of assessments levied during 1886 .....	148 05
Amount of premium notes in force, after deducting all payments thereon and assessments levied. ....	13,978 72
Total assets, .....	<u>\$14,526 86</u>

## LIABILITIES.

Money borrowed .....	\$500 00
Interest accrued .....	20 40
Total liabilities.....	<u>\$520 40</u>

## RECEIPTS.

Cash on hand at head office (not extended) .....	\$81.04
" received for assessments levied in 1886 .....	\$1,113 27
" " " " before 1886.....	46 92
" " interest .....	2 64
" " carpenters' risk, etc.....	2 40
" borrowed .....	500 00
Total receipts .....	<u>\$1,659 23</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents .....	\$150 85
" statutory assessment .....	17 04
" printing, stationery and advertising.....	26 05
" auditors' fees .....	4 00
" postage.....	21 33
" sundries.....	7 00
Total expenses of management .....	<u>\$226 27</u>
Cash paid for losses during 1886 .....	1,113 91
Total expenditure .....	<u>\$1,340 18</u>

## CURRENCY OF RISKS.

*Amount covered by policies in force 31st December, 1886.*

SYSTEM.	Three years.	Four years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Mutual.....	374,098 00	4,950 00	342,433 00	721,481 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	489	597,980 00
“ taken during 1886, new and renewed .....	128	162,356 00
Gross number during 1886.....	617	760,336 00
Deduct expired and cancelled in 1886.....	35	38,855 00
Net risks in force 31st December, 1886 .....	582	721,481 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS.

	Three years.	Four years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	6,783 40	115 20	10,636 72	17,535 32
Amount of all premium notes on policies in force December 31st, 1886, after deducting all payments thereon and assessments levied.....				13,978 72
Amount of premium notes received during the year 1886 .....	2,926 31			2,926 31

## MCGILLIVRAY MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, WEST MCGILLIVRAY.

*Commenced business 2nd May, 1877.**President*—ANDREW ROBINSON.

|

*Secretary*—WM. FRASER.

Unassessed premium note capital, \$8,003.76.

## ASSETS.

Amount of cash at Head Office .....	\$ 193 77
Loan to municipality .....	2,000 00
Amount of notes or due bills less than one year overdue .....	43 60
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	8,003 76
Total assets .....	<u>\$10,241 13</u>

## LIABILITIES.—None.

## REVENUE ACCOUNT.

Cash at Head Office, as per last statement (not extended) .....	\$202 85
Cash received for membership fees, not being part payment of premium notes .....	\$ 162 75
Cash received for interest .....	130 95
“ from bills receivable .....	2,135 00
Total receipts .....	<u>2,428 70</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for statutory assessment .....	\$ 9 05
“ postage, etc. ....	6 00
“ salary and auditors' fees .....	58 00
“ commission .....	17 50
Total expenses of management .....	<u>\$90 55</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred prior to 1886 .....	\$300 00
“ rebate .....	3 60
Total expenditure .....	<u>\$394 15</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual .....	333,540 00	333,540 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	314	318,465 00
" taken during 1886, new and renewed .....	35	27,125 00
Gross number and amount of risks in force on 31st December, 1886....	349	345,590 00
Deduct, expired and cancelled in 1886 .....	22	12,050 00
Net risks in force December 31st, 1886.....	327	333,540 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessments.....	8,003 76	8,003 76
Amount of all premium notes, after deducting all payments thereon and assessments levied. ....	8,003 76	8,003 76
Amount of premium notes received during year 1886 .....	813 75	813 75

## MCKILLOP MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, LOT 17, CON. 5, MCKILLOP.

*Commenced business May 20th, 1876.**President*—THOS. E. HAYES.*Secretary*—W. J. SHANNON.

Unassessed premium note capital, \$45,606 56.

## ASSETS.

Actual cash on hand at head office .....	\$377 41
Amount unpaid of assessments levied during 1886 .....	195 00
“ “ “ “ prior to 1886 (not extended). \$80 15	
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	45,606 56
Total assets .....	<u>\$46,178 97</u>

## LIABILITIES.—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$29 99
Cash received for assessments levied in 1886 .....	\$2,468 39
“ “ “ “ years prior to 1886 .....	293 00
“ transfer fees .....	7 00
“ borrowed money .....	200 00
Total receipts .....	<u>\$2,968 39</u>

## EXPENDITURE.

*Expenses of Management:*

Amount paid for law costs .....	\$3 10
“ investigation and adjustment of claims .....	7 10
“ travelling expenses .....	15 00
“ statutory assessment .....	59 18
“ printing, stationery and advertising .....	70 92
“ salaries, directors' and auditors' fees .....	472 50
“ postage, telegrams and express .....	41 97
“ interest .....	7 00
“ rent and taxes .....	10 00
Total expenses of management .....	<u>\$686 77</u>

*Miscellaneous Payments:*

Cash paid for losses which occurred during 1886 .....	\$1,708 00
“ rebate and returned premiums .....	1 10
“ repayment of loans .....	200 00
“ sundries .....	25 10
Total expenditure .....	<u>\$2,620 97</u>



## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.
Mutual .....	760,310 00	1,298,883 75	2,059,193 75

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	1,691	2,075,853 75
“ new and renewed during 1886 .....	547	767,410 00
Gross number during 1886 .....	2,148	2,843,263 75
Less expired and cancelled in 1886 .....	613	784,070 00
Net risks in force on mutual system, 31st December, 1886 .....	1,535	2,059,193 75

## CLASSIFICATION OF RISKS :

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force December 31st, 1886.*

	Three year risks.	Five year risks.	Total.
	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	20,021 69	34,085 10	54,106 79
Amount of all premium notes, after deducting all payments thereon and assessments levied .....			45,606 56
Amount of premium notes received during the year 1886 .....			20,200 79

## NICHOL MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, FERGUS.

*Commenced business 1st May, 1860.**President*—WILLIAM TAYLOR.*Secretary*—JOHN BEATTIE.

Unassessed premium note capital, \$63,240.06.

## ASSETS.

Actual cash on hand at head office.....	\$117 62
Amount unpaid of assessments levied during 1886 .....	1,633 09
“ “ “ in prior years (not extended). \$1,067 23	
“ of short date notes or due bills, less than one year overdue.....	157 54
“ “ “ one year or more overdue (not extended).....	\$162.33
“ of premium notes in force, after deducting all payments thereon and assessments levied.....	63,240 06
Total assets .....	<u>\$65,148 31</u>

## LIABILITIES.

Amount of losses adjusted .....	\$900 39
“ money borrowed .....	2,650 00
Total liabilities .....	<u>\$3,550 39</u>

## RECEIPTS.

Cash at head office as per last statement (not extended).....	\$2,367 96
Cash received as first payments, being part payment of premium notes....	\$822 62
“ for assessments levied in 1886 .....	4,173 31
“ “ “ years prior to 1886 .....	2,079 98
“ for bills receivable .....	624 02
“ for interest .....	20 93
Cash borrowed.....	10,300 00
Total receipts .....	<u>\$18,020 86</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for interest.....	\$186 64
“ investigation and adjustment of claims.....	71 20
“ statutory assessment .....	61 78
“ printing, stationery and advertising .....	111 03
“ commission .....	591 00

<i>Carried forward</i> .....	<u>\$1 021 65</u>
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<i>Brought forward</i> .....	\$1,021 65
Amount paid for salaries, directors' and auditors' fees .....	734 71
“ postage, telegrams and express .....	70 85
“ travelling expenses .....	20 00
“ incidentals .....	7 88
Expenses of management .....	\$1,855 09
<i>Miscellaneous Payments:</i>	
Cash paid for losses which occurred prior to 1886 .....	\$2,818 50
“ “ during 1886 .....	4,688 60
“ rebate and refund .....	7,507 10
Repayment of loans .....	9 01
Repayment of loans .....	10,900 00
Total expenditure .....	\$20,271 20

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual .....	1,946,407 00	1,946,407 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	1,644	2,167,207 00
“ new and renewed during 1886 .....	394	588,175 00
Gross numbers and amount during 1886 .....	2,038	2,705,382 00
Less expired and cancelled in 1886 .....	582	758,975 00
Net risks in force on mutual system, 31st December, 1886 .....	1,456	1,946,407 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company and legally liable to assessment .....	75,389 66	75,389 66
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	63,240 06	63,240 06
Amount of premium notes received during the year 1886 .....	20,762 24	20,762 24

# EAST AND WEST MISSOURI AND WEST ZORRA MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, KINTORE.

*Commenced business 25th May, 1878.*

*President* — DAVID CHALMERS.

*Secretary*—E. J. PEARSON.

Unassessed premium note capital, \$68,961 72.

## ASSETS.

Cash deposited to the Company's credit in Bank of London, Ingersoll . . .	\$1,332 34
Amount unpaid of assessments levied during 1886 . . . . .	906 70
“ of premium notes in force, after deducting all payments thereon and assessments levied . . . . .	68,961 72
Total assets . . . . .	<u>\$71,200 76</u>

## LIABILITIES.

Amount of losses resisted and reported . . . . .	\$890 00
“ adjusted losses . . . . .	372 80
“ loan . . . . .	1,866 00
“ interest on loan . . . . .	49 60
Total liabilities . . . . .	<u>\$3,178 40</u>

## RECEIPTS.

Cash received as first payments, being part payment of premium notes . . .	\$190 00
“ for assessments levied in 1886 . . . . .	2,118 59
“ “ “ before 1886 . . . . .	1,420 74
Cash borrowed . . . . .	1,500 00
Total receipts . . . . .	<u>\$5,229 33</u>

## EXPENDITURE.

### *Expenses of Management :*

Amount paid for statutory assessment . . . . .	\$41 63
“ commission to agents . . . . .	40 00
“ printing, stationery and advertising . . . . .	85 44
“ rent . . . . .	7 00
“ salaries, directors' and auditors' fees . . . . .	219 90
“ investigation of claims . . . . .	27 00
“ postage, etc. . . . .	15 58
“ incidentals . . . . .	15 30

Expenses of management (*carried forward*) . . . . . \$451 85

Expenses of management ( <i>brought forward</i> ).....		\$451 85
<i>Miscellaneous Payments:</i>		
Cash paid for losses which occurred before 1886 .....	\$902 50	
“ “ which occurred during 1886.....	2,391 40	
		3,293 90
Repayment of loans.....		51 24
Amount paid as reward for conviction of incendiary .....		100 00
Total expenditure .....		<u>\$3,896 99</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual .....	1,553,326 00	1,553,326 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	887	1,460,421 00
“ new and renewed during 1886 .....	244	419,730 00
Gross number during 1886 .....	1,131	1,880,151 00
Less expired and cancelled in 1886.....	200	326,825 00
Net risks in force on mutual system 31st December, 1886 ....	931	1,553,326 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	77,666 30	77,666 30
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	68,961 72	68,961 72
Amount of premium notes received during the year 1886.....	20,986 50	20,986 50

## NORFOLK COUNTY FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, SIMCOE.

*Commenced business 30th January, 1882.**President*—R. M. WILSON.*Secretary*—WM. ROBERTS.

Unassessed premium note capital, \$10,494.93.

## ASSETS.

Cash at head office .....	\$109 28	
Cash on deposit to Company's credit in Federal Bank of Canada, Simcoe .....	563 29	
		\$672 57
Cash in agents' hands .....		70 39
Amount of premium notes in force after deducting all payments thereon and assessments levied .....		10,494 93
Amount unpaid of assessments levied during 1886 .....		221 42
Due bills less than one year overdue .....		56 47
Total assets .....		<u>\$11,515 78</u>

## LIABILITIES.

Amount of loss adjusted .....	\$400 00
Salaries, directors' and auditors' fees .....	421 39
Rent, etc .....	75 00
Sundries .....	5 50
Total liabilities .....	<u>\$901 89</u>

## REVENUE ACCOUNT.

Cash at head office as per last statement (not extended) .....	\$1,657 50
Cash received as first payments on deposits, being part payment of premium notes .....	\$832 95
Cash received for assessments levied in 1886 .....	1,275 00
“ “ “ “ former years .....	338 55
“ “ for interest .....	16 96
“ “ for transfer and other fees .....	15 00
“ borrowed .....	600 00
Total receipts .....	<u>\$3,078 46</u>

## EXPENDITURE.

*Expenses of Management.*

Amount paid for commission .....	\$92 75
“ “ law costs .....	10 00
“ “ printing, stationery and advertising .....	79 36
“ “ interest .....	66 25
“ “ rent and taxes .....	52 00
“ “ statutory assessment .....	31 56
“ “ salaries, directors' and auditors' fees .....	582 90
“ “ postage, telegrams and express .....	36 99
“ “ investigation of claims .....	16 75
Expenses of management ( <i>carried forward</i> ) .....	<u>\$968 56</u>



Expenses of management ( <i>brought forward</i> ).....	£968 56
<i>Miscellaneous Expenses:</i>	
Cash paid for losses which occurred before 1886 .....	£1,250 00
“ “ “ “ during 1886.....	529 00
	1,779 00
“ “ repayment of loans .....	1,300 00
“ “ rebate .....	21 93
Total expenditure.....	<u>£4,069 49</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Two years.	Three years.	Total.
	£ c.	£ c.	£ c.	£ c.
Mutual ....	3,200 00	2,000 00	10,884 38	1,093,638 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		£ c.
Policies in force 31st December, 1885 .....	1,180	1,102,949 00
“ new and renewed during 1886 .....	371	329,440 00
Gross number during 1886 ..	1,551	1,432,389 00
Less expired and cancelled in 1886 .....	372	338,751 00
Net risks in force 31st December, 1886.....	1,179	1,093,638 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	One year risks.	Two year risks.	Three year risks.	Total.
	£ c.	£ c.	£ c.	£ c.
Amount of face of all premium notes legally liable to assessment.....	17 00	22 85	16,505 44	16,545 29
Amount of all premium notes after deducting all payments thereon and assessments levied .....				10,494 93
Amount of premium notes received during the year 1886.....				4,874 95

## ONEIDA FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, TOWN HALL, ONEIDA.

*Commenced business 27th March, 1875.**President*—DAVID KETT.*Secretary*—JOHN SENN.

Unassessed premium note capital, \$9,680.08.

## ASSETS.

Actual cash on hand at head office .....	\$146 73
Amount of premium notes in force, after deducting all payments thereon and assessments levied. ....	9,680 08
Total assets .....	<u>\$9,826 81</u>

LIABILITIES—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended) ....	\$153 25
Cash received at taking of applications.....	\$102 00
“ for steam threshing certificates .....	13 50
Total receipts .....	<u>\$115 50</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for fuel and light .....	\$2 00
“ “ statutory assessment or certificate .....	12 27
“ “ printing, stationery and postage .....	16 25
“ “ salaries, directors' and auditors' fees .....	81 00
“ “ books and stationery .....	
Total expenses of management .....	<u>\$111 52</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886.....	10 50
Total expenditure .....	<u>\$122 02</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.
Mutual .....	410,749 00	34,645 00	445,394 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	338	430,354 00
New and renewed during 1886 .....	109	153,095 00
Gross number during 1886 .....	447	583,449 00
Less expired and cancelled in 1886 .....	107	138,055 00
Net risks in force on mutual system, 31st December, 1886.....	340	445,394 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Five year risks.	Total.
	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company and legally liable to assessment .....	9,052 18	1,092 89	10,145 07
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	9,052 18	627 90	9,680 08
Amount of premium notes received during the year 1886.....	3,714 26	.....	3,714 26

## OXFORD FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, EMBRO.

*Commenced business 2nd June, 1884.**President*—ALEX. MCCORQUODALE.*Secretary*—ROBT. MURRAY.

Unassessed premium note capital, \$24,129.54.

## ASSETS.

Cash at head office.....	\$43 63
Amount of premium notes in force, after deducting all payments thereon and assessments levied.....	24,129 54
Total assets .....	<u>\$24,173 17</u>

## LIABILITIES.

Amount of losses resisted .....	\$40 00
“ promissory note .....	330 00
“ interest accrued .....	2 42
Total liabilities.....	<u>\$372 42</u>

## RECEIPTS.

Cash at head office as per last statement (not extended) .....	<i>Nil.</i>
Cash received as first payments, being part payment of premium notes....	\$152 00
“ “ for assessments levied during 1886.....	502 93
“ “ “ in prior years.....	70 73
Cash borrowed .....	680 00
Cash for sundries.....	1 56
Total receipts .....	<u>\$1,407 22</u>

## EXPENDITURE.

*Expenses of Management :*

Cash paid for printing and stationery .....	\$21 00
“ interest .....	16 33
“ statutory assessment.....	13 41
“ rent .....	12 00
“ salaries, etc. ....	191 80
“ postage, etc. ....	16 60
Repayment of loan .....	46 45
Total expenses of management.....	<u>\$317 59</u>
Cash paid for losses during 1886 .....	696 00
“ being repayment of loans....	350 00
Total expenditure.....	<u>\$1,363 59</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Two years.	Three years.	Four years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Mutual .....	2,100 00	10,700 00	13,100 00	623,825 00	649,725 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force December 31st, 1885 .....	398	470,425 00
“ taken during 1886, new and renewed .....	152	197,400 00
Gross number during 1886 .....	550	667,825 00
Deduct expired and cancelled in 1886 .....	18	18,100 00
Net risks in force at December 31st, 1886 .....	532	649,725 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*(On Policies in force 31st December, 1886.)*

	Two year risks.	Three year risks.	Four year risks.	Five year risks.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	84 00	428 00	524 00	24,864 50	25,900 50
Amount of all premium notes, after deducting all payments thereon and assessments levied .....					24,120 54
Amount of premium notes received during the year 1886 .....					7,948 00

## COUNTY OF PEEL FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, BRAMPTON.

*Commenced business 24th June, 1876.**President*—THOMAS HOLBY.*Secretary*—LUTHER CHEYNE.

Unassessed premium note capital, \$33,060.86.

## ASSETS.

Cash on deposit in Central Bank, Brampton .....	\$301 40	
Actual cash on hand at head office .....	100 56	
		\$401 96
Amount unpaid of assessments levied during 1886 .....		975 73
“ “ “ in prior years (not extended) \$125 68		
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....		33,060 86
Total assets .....		<u>\$34,438 55</u>

## LIABILITIES.

Amount of loss adjusted .....	\$5 00
Total liabilities .....	<u>\$5 00</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended) .....	\$438 28
Cash received as first payment, being part payment of premium notes....	\$1,182 83
“ for assessments levied in 1886 .....	3,468 47
“ “ “ years prior to 1886 .....	1,564 81
“ for carpenters' risks .....	4 35
“ borrowed money .....	950 00
Total receipts .....	<u>\$7,170 46</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents .....	\$370 00
“ investigation and adjustment of claims .....	24 05
“ interest .....	6 05
“ statutory assessment .....	74 64
“ printing, stationery and advertising .....	124 05
“ salaries, directors' and auditors' fees .....	1,234 81
“ postage, telegrams and express .....	179 28
“ rent .....	102 00
“ rebate on postage stamps .....	9 25
“ refunded account of error in assessment of 1885....	48 65
Total expenses of management .....	<u>\$2,172 78</u>



Total expenses of management (*brought forward*) . . . . \$2,172 78

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 . . . . .	\$4,024 74	
.. .. " .. " prior to 1886 . . . . .	57 50	
		4,082 24
Cash paid for repayments of loans . . . . .		950 00
" .. sundries . . . . .		1 86
Total expenditure . . . . .		\$7,206 88

CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Four years.	Total.
	\$ c.	\$ c.
Mutual . . . . .	2,953,604 00	2,953,604 00

MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 . . . . .	1,870	2,617,639 00
" .. new and renewed during 1886 . . . . .	740	1,073,445 00
Gross number during 1886 . . . . .	2,610	3,691,084 00
Less expired and cancelled in 1886 . . . . .	586	737,480 00
Net risks in force on mutual system, 31st December, 1886 . . . . .	2,024	2,953,604 00

CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Four year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment . . . . .	61,728 97	61,728 97
Amount of all premium notes, after deducting all payments thereon and assessments levied . . . . .	33,060 36	33,060 36
Amount of premium notes received during the year 1886 . . . . .	22,481 33	22,481 33

## PUSLINCH MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, ABERFOYLE.

*Commenced business May, 1859.**President*—DUNCAN MCFARLANE.*Secretary*—JAMES SCOTT.

Unassessed premium note capital, \$7,949.23.

## ASSETS.

Cash on hand at head office.....	\$99 19	
Cash on deposit to Company's credit in Bank of Commerce, Guelph.....	513 00	\$612 19
Amount of premium notes in force, after deducting all payments thereon and assessments levied.....	\$7,949 23	
Less residue of premium notes given for reinsurance.....	31 20	7,918 03
Total assets.....		<u>\$8,530 22</u>

## LIABILITIES—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$26 99	
Cash received for membership fees, not being part payment of premium notes.....		\$10 00
Cash received as first payments, being part payment of premium notes ...		174 97
“ for interest.....		19 72
“ for assessments levied in 1886 .....		872 94
Total receipts.....		<u>\$1,077 63</u>

## EXPENDITURE.

*Expenses of Management:*

Amount paid for statutory assessment.....	\$11 88
“ printing, stationery and advertising.....	20 45
“ salaries, directors' and auditors' fees.....	26 00
“ postage, telegrams and express.....	6 30
“ investigation of claim.....	4 00
“ law costs.....	23 00
Total expenses of management.....	<u>\$91 63</u>
Amount paid for losses which occurred during 1886 .....	893 80
Total expenditure.....	<u>\$985 43</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual.....		462,650 00
Reinsured.....		3,000 00
Net risks carried by Company 31st December, 1886.....		459,650 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force December 31st, 1885.....		
“ new and renewed during 1886.....		
Gross number and amount during 1886.....		
Loss expired and cancelled in 1886.....		
Net risks in force on mutual system December 31st, 1886.....	253	462,650 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS.

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	9,252 50	9,252 50
Amount of all premium notes, after deducting all payments thereon and assessments levied.....	7,949 23	7,949 23
Amount of premium notes received during the year 1886.....	3,636 90	3,636 90
Residue “ “ given for reinsurance.....		31 20

SALTFLEET AND BINBROOK MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, ELFRIDA.

Commenced business 30th July, 1880.

President—A. D. LEE.

Secretary—Jno. C. HARRIS.

Unassessed premium note capital, \$5,587.96.

ASSETS.	
Actual cash on hand at head office.....	\$ 332 85
Amount of assessments which were levied during 1886 .....	39 88
Amount unpaid of short date notes, or due bills, less than one year overdue .....	37 61
“ “ “ one year or more overdue (not extended) .....	\$11 06
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	5,587 96
Amount in agents' hands.....	2 64
Total assets .....	<u>\$6,000 94</u>

LIABILITIES.	
Balance due Directors.....	\$28 00
Total liabilities.....	<u>\$28 00</u>

RECEIPTS.	
Cash at head office, as per last statement (not extended) .....	\$42 92
Cash received for first payments, being part payment of premium notes..	\$295 09
“ assessments which were levied in 1886 .....	204 56
Cash borrowed.....	50 00
Total receipts .....	<u>\$549 65</u>

EXPENDITURE.	
<i>Expenses of Management :</i>	
Amount paid to agents for fees and commission .....	\$19 50
“ for statutory assessment .....	10 89
“ printing, stationery and advertising .....	15 45
“ salaries, directors' and auditors' fees.....	134 48
“ postage, telegrams and express.....	9 56
“ interest .....	0 84
“ travelling expenses.....	2 00
“ sundries .....	4 64
Total expenses of management .....	<u>\$197 36</u>

<i>Miscellaneous Payments :</i>	
Cash paid for losses which occurred during 1886.....	13 00
“ repayment of loans .....	50 00
Total expenditure.....	<u>\$260 36</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

	Two years.	Three years.	Total.
	\$ c.	\$ c.	\$ c.
Mutual. ....	1,500 00	383,857 00	385,357 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	312	381,905 00
“ new and renewed during 1886.....	122	150,257 00
Gross number during 1886 .....	434	532,162 00
Less expired and cancelled in 1886.....	108	146,805 00
Net risks in force 31st December, 1886 ..	326	385,357 00

## CLASSIFICATION OF RISKS :

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Two years.	Three years.	Total.
	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	10 00	7,710 92	7,720 92
Amount of all premium notes, after deducting all payments thereon and assessments levied.....	8 50	5,579 46	5,587 96
Amount of premium notes received during the year 1886.....	10 00	2,253 90	2,263 90

## SAUGEEN MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, MOUNT FOREST.

*Commenced business March, 1887.**President*—JAMES MURDOCK.*Secretary*—HENRY L. DRAKE.

Unassessed premium note capital, \$37,496.94.

## ASSETS.

Cash at head office .....	\$700 60	
“ J. A. Halstead's bank at Mount Forest.....	757 05	
		<hr/> \$1,457 65
Amount unpaid of assessment levied during 1886 .....		3,760 16
“ “ “ in prior years (not extended) \$1,875 94		
“ of premium notes in force, after deducting all payments thereon and assessments levied .....	\$37,496 94	
Less premium notes given by Company for reinsurance .....	221 23	
		<hr/> 37,275 71
Total assets .....		<hr/> \$42,493 52

## LIABILITIES.

Amount of reported loss .....	\$3,253 50
“ unpaid loans .....	7,350 00
“ due for sundry accounts .....	30 50
	<hr/>
Total liabilities .....	<hr/> \$10,634 00

## RECEIPTS.

Cash received as first payments, being part payment of premium notes....	\$1,474 16
“ for assessments levied in 1886 .....	2,875 79
“ “ “ prior to 1886 .....	3,831 51
“ for interest .....	31 42
“ for refunds .....	59 67
“ for fees and extra premiums .....	28 25
	<hr/>
Total receipts .....	<hr/> \$8,300 00



## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission to agents .....	\$1,316 65
“ law costs .....	60 00
“ interest .....	565 79
“ statutory assessment or certificate .....	38 40
“ printing, stationery and advertising .....	174 72
“ salaries, directors' and auditors' fees .....	641 25
“ postage, telegrams, express and telephone .....	69 95
“ investigation and adjustment of claims .....	161 75
“ rent and taxes .....	45 40
Expenses of management .....	<u>\$3,073 91</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	\$2,966 18
“ “ “ prior to 1886 .....	350 00
	<u>\$3,316 18</u>
“ rebate, abatement and returned premiums .....	214 35
“ reinsurances .....	39 08
“ repayment of loan .....	150 00
“ sundries in new office .....	49 63
Total expenditure .....	<u>\$6,843 15</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

	One year.	Three years.	Total.
	\$ c.	\$ c.	\$ c.
Mutual.....	29,800 00	1,259,366 00	1,289,166 00
Of which was reinsured .....			9,765 00
Net risks .....			<u>1,279,401 00</u>

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	1643	1,213,103 00
“ new and renewed during 1886.....		590,861 00
Gross number during 1886.....		1,803,964 00
Less expired and cancelled in 1886.....		523,298 00
Net risks in force 31st December, 1886.....	1643	1,280,666 00
Eight policies (reinsurance taken in 1883, expiring in 1887) . . . . .		8,500 00
		1,289,166 00

## BUSINESS DONE BY COMPANY:

General Fire Insurance.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	One year risks.	Three year risks.	Total.
	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	424 94	50,763 09	51,188 03
Amount of premium notes, after deducting all pay- ments thereon and assessments levied . . . . .	234 14	37,262 80	37,496 94
Amount of premium notes received during the year 1886.....			
Residue of premium notes given by the Company for reinsurances.....			

## SIMCOE COUNTY MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, KEENANSVILLE.

*Commenced business 21st June, 1878.**President*—P. B. SKELLY.*Secretary*—THOS. R. CARMICHAEL.

Unassessed premium note capital, \$5,097.21.

## ASSETS.

Cash at head office .....	\$120 50
Amount unpaid of assessments levied during 1886 .....	140 65
“ of premium notes in force, after deducting all payments thereon and assessments levied .....	5,097 21
Total assets .....	<u>\$5,358 36</u>

## LIABILITIES—None.

## RECEIPTS.

Cash received for taking of application .....	\$ 11 00
“ assessments levied in 1886 .....	211 95
“ “ “ years prior to 1886 .....	126 70
Total receipts .....	<u>\$349 65</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for salaries, directors' and auditors' fees ....	\$123 75
“ statutory assessment .....	5 50
“ printing and stationery .....	29 35
“ postage .....	4 07
“ sundries .....	25
Total expenses of management .....	<u>\$164 92</u>
Cash paid for losses which occurred during 1886 .....	5 00
“ repayment of loan .....	59 23
Total expenditure .....	<u>\$229 15</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Four years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Mutual .....	209,067 33	725 50	10,290 00	220,082 83

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	137	192,406 08
New and renewed during 1886 .. .. .	66	84,547 00
Gross number during 1886.....	203	276,953 08
Less expired and cancelled in 1886.....	39	56,870 25
Net risks in force 31st December, 1886 .. .	164	220,082 83

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Four year risks.	Five year risks.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company and legally liable to assessment .....	5,401 81	9 15	255 70	5,666 66
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	4,890 06	6 35	200 80	5,097 21
Amount of premium notes received during the year 1886 .. .. .	2,925 60	.....	.....	2,925 60

## THE SOUTHWOLD FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, SHEDDEN.

*Commenced business 9th September, 1878.**President*—DONALD TURNER.*Secretary*—R. N. STAFFORD.

Unassessed premium note capital, \$8,285.69.

## ASSETS.

Actual cash in hand at Head Office .....	\$ 130 17
Amount unpaid of assessments levied during 1886 .....	109 90
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....	8,285 69
Total assets .....	<u>\$8,525 76</u>

## LIABILITIES.

Amount of loss adjusted .....	\$1,800 00
Total liabilities .....	<u>\$1,800 00</u>

## RECEIPTS.

Cash at Head Office, as per last statement (not extended) .....	\$164 81
Cash received at taking of application .....	\$ 34 00
“ for assessment levied in 1886 .....	1,225 30
“ “ in years prior to 1886 .....	158 85
Cash borrowed .....	550 00
Total receipts .....	<u>\$1,969 15</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for law costs .....	\$ 2 50
“ statutory assessment .....	18 82
“ printing and stationery .....	35 97
“ salaries, directors' and auditors' fees .....	239 50
“ postage .....	14 40
“ interest .....	16 60
“ travelling expenses .....	10 00
“ rent and taxes .....	8 00
“ sundries .....	4 00
Total expenses of management .....	<u>\$349 79</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred prior to 1886 .....	\$1,104 00
“ repayment of loan .....	550 00
Total expenditure .....	<u>\$2,003 79</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual .....	657,200 00	657,200 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	493	660,150 00
Policies new and renewed during 1886 .....	68	94,350 00
Gross number during 1886 .....	561	754,500 00
Less expired and cancelled in 1886 .....	77	97,300 00
Net risks in force on mutual system 31st December, 1886 .....	484	657,200 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	13,144 00	13,144 00
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	8,285 69	8,285 69
Amount of premium notes received during the year 1886 .....	1,887 00	1,887 00



## SYDENHAM MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, ANNAN.

*Commenced business August, 1869.**President*—GIDEON HARKNESS.*Secretary*—HUGH REID.

Unassessed premium note capital, \$39,654.33.

## ASSETS.

Cash on hand at head office . . . . .	\$ 66 42	
" deposit in the Post Office Savings Bank, Owen Sound. . . . .	187 89	
" " Farmers' (Private) Bank, Owen Sound. . . . .	1,552 13	
		<u>\$1,806 44</u>
Cash in agents' hands, acknowledged by them to be due and considered good . . . . .		175 19
Amount unpaid of assessments levied during 1886 . . . . .		484 12
Amount of premium notes in force, after deducting all payments thereon and assessments levied . . . . .		39,654 33
Total assets . . . . .		<u><u>41,120 08</u></u>

LIABILITIES—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended) . . . . .	\$1,485 53	
Cash received for fees . . . . .		177 75
" as first payments, being part payment of premium notes . . . . .		824 66
" for assessments levied in years prior to 1886 . . . . .		1 84
" " 1886 . . . . .		1,392 07
" interest . . . . .		67 92
" license of steam thresher . . . . .		55 00
" advertisements in annual report . . . . .		55 00
Total receipts . . . . .		<u><u>\$2,574 24</u></u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for law costs . . . . .	10 00
" investigation and adjustment of claims . . . . .	6 00
" statutory assessment or certificate . . . . .	51 81
" printing, stationery and advertising . . . . .	85 20
" rent and taxes . . . . .	8 00
" salaries, directors' and auditors' fees . . . . .	246 00
" postage, telegrams and express . . . . .	78 42
" sundries . . . . .	29 00
Expenses of management . . . . .	<u>\$514 43</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 . . . . .	1,738 90
Total expenditure . . . . .	<u><u>\$2,253 33</u></u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Two years.	Three years.	Four years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Mutual . . . . .	8,064 00	17,575 00	1,820,056 00	83,676 00	171,598 00	2,100,969 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 . . . . .	1,635	1,807,471 00
Policies new and renewed during 1886 . . . . .	712	833,613 00
Gross number during 1886 . . . . .	2,347	2,641,084 00
Less expired and cancelled in 1886 . . . . .	463	540,115 00
Net risks in force 31st December, 1886 . . . . .	1,884	2,100,969 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force December 31st, 1886.*

	One year risks.	Two year risks.	Three year risks.	Four year risks.	Five year risks.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment . . . . .	164 78	393 45	37,986 92	1,639 62	3,603 09	43,787 86
Amount of all premium notes, after deducting all payments thereon and assessments levied . . . . .						39,654 33
Amount of premium notes received during the year 1886 . . . . .	126 28	302 50	15,463 88	763 15	647 56	17,303 37

## TOWNSEND FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, WATERFORD.

*Commenced business 10th April, 1879.**President*—OSCAR McMICHAEL.*Secretary*—LYMAN N. COLLVER.

Unassessed premium note capital. \$13,464.07.

## ASSETS.

Actual cash on hand at head office . . . . .	\$323 11
Amount unpaid of assessments levied during 1886 . . . . .	13 90
Amount of premium notes in force, after deducting all payments thereon and assessments levied . . . . .	13,464 07
Total assets . . . . .	<u>\$13,801 08</u>

LIABILITIES—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended) . . . . .	\$259 57
Cash received at taking of applications . . . . .	\$127 50
“ at first payments, being part payment of premium notes . . . . .	237 18
“ for assessments in years prior to 1886 . . . . .	65 86
Total receipts . . . . .	<u>\$430 54</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for statutory assessment . . . . .	\$26 13
“ printing, stationery, advertising and postage . . . . .	37 02
“ salaries, directors' and auditors' fees . . . . .	263 85
Total expenses of management . . . . .	<u>\$327 00</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 . . . . .	40 00
Total expenditure . . . . .	<u>\$367 00</u>

CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual .....	966,455 00	966,455 00

MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	647	916,490 00
“ new and renewed during 1886.....	255	363,295 00
Gross number during 1886.....	902	1,279,785 00
Less expired and cancelled in 1886.....	231	313,330 00
Net risks in force on mutual system 31st December, 1886 .....	671	966,455 00

CLASSIFICATION OF RISKS :

Farm and Non-hazardous.

PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	15,572 77	15,572 77
Amount of all premium notes, after deducting all payments thereon, and assessments levied .....	13,464 07	13,464 07
Amount of premium notes received during the year 1886 .....	5,927 56	5,927 56

## THE USBORNE AND HIBBERT MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, FARQUHAR.

*Commenced business 28th June, 1876.**President*—ROBERT GARDINER.*Secretary*—JAMES GILLESPIE.

Unassessed premium note capital, \$27,291 64.

## ASSETS.

Actual cash on hand at head office .....	\$404 45
Amount unpaid of assessments levied during 1886 .....	192 07
“ of premium notes in force, after deducting all payments thereon and assessments levied.....	27,291 64
Total assets .....	<u>\$27,888 16</u>

## LIABILITIES—None.

## RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$716 81
“ received for assessments levied in 1886.....	\$1,509 86
“ “ “ “ before 1886.....	88 22
“ borrowed money .....	225 00
“ interest.....	7 45
Total receipts .....	<u>\$1,830 53</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for investigation of claims ..	\$6 00
“ interest .....	5 25
“ statutory assessment .....	39 26
“ printing, stationery and advertising.....	28 25
“ rent, taxes, fuel and light.....	20 00
“ salaries, directors' and auditors' fees .....	188 50
“ travelling expenses .....	15 00
“ postage, telegrams and express.....	20 00
“ incidental expenses .....	21 63
Expenses of management .....	<u>\$343 89</u>

*Miscellaneous Payments :*

Amount paid for losses which occurred during 1886.....	\$1,574 00
“ for repayment of loans.....	225 00
Total expenditure .....	<u>\$2,142 89</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual.....	1,631,755 00	1,631,755 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	1,041	1,377,055 00
“ new and renewed during 1886 .....	332	509,150 00
Gross number during 1886.....	1,373	1,886,205 00
Less expired and cancelled in 1886... ..	202	254,450 00
Net risks in force on mutual system 31st December, 1886 .....	1,171	1,631,755 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	35,778 35	35,778 35
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	27,291 64	27,291 64
Amount of premium notes received during the year 1886.....	11,161 33	11,161 33



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VICTORIA MUTUAL FIRE INSURANCE COMPANY.

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HEAD OFFICE, HAMILTON.

*Commenced business November, 1863.*

*President*—GEO. H. MILLS.

*Secretary*—W. D. BOOKER.

Unassessed premium note capital, \$30,733.67.

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ASSETS.

Cash on hand at head office .....	\$126 43	
Postage stamps .....	12 72	
		\$139 15
Amount unpaid of assessments levied during 1886 .....		1,217 88
“ “ “ in prior years (not extended) .....	\$852 19	
Amount of short date notes or due bills, less than one year overdue .....		197 66
“ “ “ one year or more over-due (not extended) .....	\$115 02	
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....		30,733 67
Due by W. W. Branch (not extended) .....	\$6,546 60	
Division Court costs (not extended) .....	45 77	
Office furniture (not extended) .....	100 00	
Total assets .....		<u>\$32,288 36</u>

LIABILITIES.

Overdrawn account .....	\$1,241 97
Deposits for future assessments .....	20 63
Agency .....	74 00
Total liabilities .....	<u>\$1,336 60</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended) . . . . .	\$192 79	
Cash as first payments, being part payment of premium notes . . . . .		\$1,409 81
Cash received for assessments levied in 1886 . . . . .		4,247 68
“ “ “ years prior to 1886 . . . . .		586 98
Cash received for interest . . . . .		23 85
“ carpenters' risks . . . . .		33 80
“ bills receivable . . . . .		13 64
“ stamps sold . . . . .		14 14
“ fees on endorsements . . . . .		2 00
“ overdrawn account, Bank of Hamilton . . . . .		1,241 97
Total receipts . . . . .		<u>\$7,573 87</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for commission . . . . .	\$1,051 81	
“ investigation and adjustment of claims . . . . .	33 49	
“ legal expenses . . . . .	142 07	
“ printing, stationery and advertising . . . . .	211 31	
“ rent and taxes . . . . .	385 23	
“ salaries, directors' and auditors' fees . . . . .	2,648 00	
“ postage, telegrams and express . . . . .	37 06	
“ fuel and light . . . . .	32 00	
“ statutory assessment . . . . .	32 38	
“ office contingencies . . . . .	63 73	
“ interest . . . . .	52 25	
Total expenses of management . . . . .		4,689 33

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 . . . . .	2,924 04
Total expenditure . . . . .	<u>\$7,613 37</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force, 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual . . . . .	1,195,179 00	1,195,179 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.. .. .	938	1,135,568 00
Policies new and renewed during 1886. .... .	324	412,815 00
Gross number during 1886 .....	1,262	1,548,383 00
Less expired and cancelled in 1886. .... .	281	353,204 00
Net risks on in force on mutual system 31st December, 1886. .... .	981	1,195,179 00

## BUSINESS TRANSACTED :

## General Fire Insurance.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment. .... .	42,155 77	42,155 77
Amount of all premium notes, after deducting all payments thereon and assessments levied. .... .		30,733 67
Amount of premium notes received during the year 1886. .... .		13,686 98

## WALPOLE FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, JARVIS.

*Commenced business 27th July, 1867.**President*—CHARLES SIMON.*Secretary*—JOHN HEASMAN.

Unassessed premium note capital, \$25,329.97.

## ASSETS.

Cash on hand at head office .....	\$204 71	
Cash on deposit in Bank of Commerce, Simcoe .....	724 13	
		<u>\$928 84</u>
Cash in agents' hands acknowledged by them to be due, and considered good.		64 54
Amount unpaid of assessments levied before 1886 (not extended).	\$4 30	
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....		25,329 97
Total assets .....		<u><u>\$26,323 35</u></u>

## LIABILITIES.

Amount of loss adjusted .....	\$300 00
Total liabilities .....	<u><u>\$300 00</u></u>

## RECEIPTS.

Cash at head office and in bank, as per last statement (not extended) .....	\$906 22	
Cash received at taking of applications .....		\$253 50
“ as first payments, being part payment of premium notes ..		233 06
“ for assessments levied in years prior to 1886 .....		2 88
“ for interest .....		24 13
Total receipts .....		<u><u>\$513 57</u></u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid to agents for commission and fees on application .....	\$94 50
“ for investigation and adjustment of claims .....	12 00
“ statutory assessment .....	33 75
“ printing, stationery and advertising .....	34 25
“ salaries, directors' and auditors' fees .....	261 20
“ postage, telegrams and express .....	6 00
“ fuel and light .....	11 00
Total expenses of management .....	<u><u>\$452 70</u></u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	\$38 25
Total expenditure .....	<u><u>\$490 95</u></u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	One year or less.	Two years.	Three years.	Four years.	Five years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Mutual .....	6,430 00	13,623 00	292,373 00	16,700 00	913,000 00	1,242,126 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	784	1,183,955 00
“ new and renewed during 1886 .....	181	292,129 00
Gross number during 1886.....	965	1,496,084 00
Less expired and cancelled in 1886 .....	182	233,958 00
Net risks in force on mutual system 31st December, 1886 .....	783	1,242,126 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	One year risks.	Two year risks.	Three year risks.	Four year risks.	Five year risks.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	32 01	137 04	4,583 44	338 27	23,287 72	28,378 72
Amount of premium notes, after deducting all payments thereon and assessments levied.....	30 73	130 74	4,198 23	303 66	20,667 11	25,329 97
Amount of premium notes received during the year 1886.....	32 01	84 02	1,353 67	83 25	4,764 74	6,317 69

## NORTH WATERLOO FARMERS' MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, WATERLOO.

*Commenced business 1st August, 1874.**President*—JACOB WAHL.*Manager*—LEVI STAUFFER.

Unassessed premium note capital, \$110,285.43.

## ASSETS.

Cash on hand at head office.....	\$649 06
Amount unpaid of assessments levied during 1886 .....	862 96
“ “ “ “ in prior years (not extended) \$48 93	
“ of premium notes in force, after deducting all payments thereon and assessments levied .....	110,285 43
Total assets .....	<u>\$111,797 45</u>

## LIABILITIES.

Unpaid losses .....	\$1,600 00
Total liabilities.....	<u>\$1,600 00</u>

## RECEIPTS.

Cash received for assessments levied in 1886 .....	\$4,474 06
“ “ “ “ years prior to 1886 .....	671 76
Cash borrowed.....	5,122 50
Total receipts .....	<u>\$10,268 32</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for investigation and adjustment of claims .....	\$17 00
“ interest .....	63 50
“ statutory assessment .....	66 66
“ printing, stationery and advertising.....	54 10
“ salaries, directors' and auditors' fees .....	569 00
“ postage, telegrams and express.....	33 56
“ incidentals .....	4 75
Expenses of management .....	<u>\$808 57</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886.....	5,356 50
“ loans repaid .....	3,522 50
Total expenditure .....	<u>\$9,687 57</u>



## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five Years.	Total.
	\$ c.	\$ c.
Mutual.....	2,415,174 00	2,415,174 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 .....	1,315	2,338,344 00
“ new and renewed during 1886 .....	300	529,945 00
Gross number during 1886.....	1,615	2,868,289 00
Less expired and cancelled in 1886.....	290	453,115 00
Net risks in force on mutual system December 31st, 1886 .....	1,325	2,415,174 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	130,541 00	130,541 00
Amount of premium notes, after deducting all payments thereon and assessments levied .....	110,285 43	110,285 43
Amount of premium notes received during the year 1886 .....	27,066 00	27,066 00

## WEST WAWANOSH MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, ST. HELENS.

*Commenced business 13th May, 1879.**President*—CHAS. GARVIN.

|

*Secretary*—ROBT. MURRAY.

Unassessed premium note capital, \$81,627.78.

## ASSETS.

Actual cash on hand at head office.....	\$ 88 69
Amount unpaid of assessments levied during 1886 .....	515 82
Amount of premium notes in force, after deducting all payments thereon and assessments levied.....	81,627 78
Total assets .....	<u>\$82,232 29</u>

LIABILITIES.—None.

## RECEIPTS.

Cash at Head Office, as per last statement (not extended) .....	\$155 00	
Cash received for assessments levied in 1886 .....		\$3,363 96
“ “ before 1886.....		48 22
“ from steam-thresher certificates .....		25 00
“ transfer fees and advanced assessment.....		6 88
Total receipts.....		<u>\$3,444 06</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for interest .....	\$ 81 28
“ statutory assessment .....	47 07
“ printing, stationery and advertising .....	48 00
“ salaries, directors' and auditors' fees .....	615 15
“ postage, telegrams and express .....	57 54
“ travelling expenses.....	5 00
Expenses of management .....	<u>\$ 854 04</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886.....	1,654 64
“ refunds .....	1 69
“ repayment of loans .....	1,000 00
Total expenditure .....	<u>\$3,510 37</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual . . . . .	2,193,159 00	2,193,159 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885 . . . . .	1,378	1,650,284 00
New and renewed during 1886 . . . . .	651	867,030 00
Gross number during 1886 . . . . .	2,029	2,517,314 00
Less expired or cancelled in 1886 . . . . .	297	324,155 00
Net risks in force 31st December, 1886 . . . . .	1,732	2,193,159 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Five year risks.	Total.
	\$ c.	\$ c.
Amount of all premium notes held by Company, and legally liable to assessment . . . . .	87,726 36	87,726 36
Amount of all premium notes, after deducting all payments thereon and assessments levied . . . . .	81,627 78	81,627 78
Amount of premium notes received during the year 1886 . . . . .	34,681 20	34,681 20

THE MUTUAL FIRE INSURANCE COMPANY OF THE COUNTY OF WELLINGTON.

HEAD OFFICE, GUELPH.

*Commenced business, September, 1840.*

*President*—FRED. W. STONE. | *Secretary*—CHARLES DAVIDSON.

Unassessed premium note capital, \$344,284.58.

ASSETS.

Cash on hand at head office .....	\$683 02	
“ deposit to Company’s credit in Bank of Commerce, Guelph .....	12,806 78	\$13,489 80
Cash in Agents’ hands, acknowledged by them to be due and considered good .....		330 38
Amount unpaid of assessments levied during 1886 .....		1,465 60
“ “ “ in prior years (not ex- tended) .....	\$1,112 51	
“ unpaid due bills less than one year overdue .....		1,007 99
“ of premium notes in force, after deducting all payments thereon and assessments levied .....		344,284 58
Total assets .....		<u>\$360,578 35</u>

LIABILITIES.

Amount of losses adjusted .....	\$2,317 34
Amount of outstanding accounts .....	39 72
Total liabilities .....	<u>\$2,357 06</u>

## RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$586 98	
“ received as first payments, being part payment of premium notes....		\$9,003 34
“ “ for assessments levied in 1886.....		14,036 84
“ “ “ “ years prior to 1886.....		4,014 24
“ agents' balances .....		328 29
“ received from carpenters' risks, and transferred policies.....		57 08
“ “ “ refunded Director's fees.....		46 20
Cash received from interest .....		407 57
“ “ promissory notes, etc.....		337 60
Total receipts .....		<u>\$28,231 16</u>

## EXPENDITURE.

*Expenses of Management:*

Amount paid for commissions to agents .....	\$3,650 29
“ law costs.....	68 89
“ fuel and light.....	48 94
“ investigation and adjustment of claims .....	365 49
“ statutory assessment .....	91 51
“ printing, stationery, and advertising .....	606 40
“ rent and taxes .....	92 66
“ salaries, directors' and auditors' fees .....	2,782 40
“ travelling expenses .....	104 05
“ postage, telegrams and express.....	288 73
Expenses of management .....	<u>\$8,099 36</u>

*Miscellaneous Payments:*

Cash paid for losses which occurred during 1886.....	\$11,520 00
“ rebate, abatements and returned premiums ....	449 89
“ sundries.....	46 64
Total expenditure .....	<u>\$20,115 89</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three years.	Total.
	\$ c.	\$ c.
Mutual.....	3,516.054 00	3,516,054 00

MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	2618	3,210,043 00
“ new and renewed during 1886 .....	1120	1,416,854 00
Gross number and amount during 1886.....	3738	4,626,897 00
Less expired and cancelled in 1886.....	952	1,110,843 00
Net risks in force on mutual system, 31st December, 1886.....	2786	3,516,054 00

BUSINESS TRANSACTED BY COMPANY :

General Fire Insurance.

PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	388,858 91	388,858 91
Amount of all premium notes, after deducting all payments thereon and assessments levied .....	344,284 58	344,284 58
Amount of premium notes received during the year 1886 .....	164,097 24	164,097 24



## THE WESTMINSTER MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, LOT 14, CON. 4, WESTMINSTER.

*Commenced business 11th December, 1857.**President*—JOHN M. LITTLE.*Secretary*—HENRY ANDERSON.

Unassessed premium note capital, \$18,099.60.

## ASSETS.

Cash at head office .....	\$33 32	
Cash on deposit to the Company's credit, not drawn against in		
Canadian Trust and Loan Company, London.....	2,196 29	
London Loan and Savings Company, London.....	5,238 00	
		\$7,467 61
Amount of premium notes in force, after deducting all payments thereon		
and assessments levied .....		18,099 60
Total assets .....		<u>\$25,567 21</u>

## LIABILITIES.—None.

## RECEIPTS.

Cash at head office on deposit as per last statement (not extended) .....	\$6,623 94	
Cash received for assessments levied in 1886 .....		\$2,130 95
" interest .....		364 35
" membership fees .....		157 16
" borrowed .....		1 00
Total receipts .....		<u>\$2,653 46</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for investigation and adjustment of claims.....	36 50
" statutory assessment or certificate .....	33 18
" printing, stationery and advertising .....	27 85
" salaries, directors' and auditors' fees.....	372 50
" commission .....	5 30
" gratuity to ex-Treasurer .....	165 00
Expenses of management .....	<u>\$640 33</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	1,167 58
" repayment of loans .....	1 88
Total expenditure.....	<u>\$1,809 79</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Five years.	Total.
	\$ c.	\$ c.
Mutual.....	1,162,110 00	1,162,110 00

## MOVEMENT IN RISKS.

*Mutual System.*

—	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	845	1,163,510 00
New and renewed during 1886.....	208	305,010 00
Gross number during 1886.....	1,053	1,468,520 00
Less expired and cancelled in 1886.....	233	306,410 00
Net risks in force 31st December, 1886.....	820	1,162,110 00

## CLASSIFICATION OF RISKS :

Farm and non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

—	Five years.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment.....	23,242 20	23,242 20
Amount of all premium notes, after deducting all payments thereon and assessments levied.....	18,099 60	18,099 60
Amount of premium notes received during the year 1886.....		6,100 20

## TOWNSHIP OF EAST WILLIAMS MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, NAIRN.

*Commenced business 8th August, 1875.**President*—NEIL McTAGGART.*Secretary*—WM. McCALLUM.

Unassessed premium note capital, \$4,983.02.

## ASSETS.

Cash on hand .....	\$37 58	
Cash in Bank of Commerce, at Parkhill .....	918 70	
		<u>\$956 28</u>
Cash in agents' hands, acknowledged by them to be due and considered good.		18 10
Amount unpaid of assessments levied during 1886 .....		128 18
“ “ “ “ in prior years (not extended) \$43 12		
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....		4,983 02
Total assets .....		<u>\$6,085 58</u>

## LIABILITIES.—None.

## RECEIPTS.

Cash at Head Office, as per last statement (not extended) ....	\$432 83	
Cash received as first payments on premium notes .....		\$189 41
“ on assessments levied during 1886 .....		311 44
“ “ “ prior to 1886 .....		108 96
“ on agents' balances .....		28 52
“ on interest .....		18 70
Total receipts .....		<u>\$657 03</u>

## EXPENDITURE.

*Expenses of Management :*

Amount paid for statutory assessment .....	\$8 63
“ printing, stationery and advertising .....	12 25
“ salaries, directors' and auditors' fees .....	82 00
“ postage .....	1 60
“ incidentals .....	25
Expenses of management .....	<u>\$104 73</u>

*Miscellaneous Payments :*

Cash paid for losses which occurred during 1886 .....	23 00
“ rebate .....	5 85
Total expenditure .....	<u>\$133 58</u>

## CURRENCY OF RISKS.

*Amount covered by Policies in force 31st December, 1886.*

SYSTEM.	Three Years.	Total.
	\$ c.	\$ c.
Mutual.....	315,915 00	315,915 00

## MOVEMENT IN RISKS.

*Mutual System.*

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885.....	258	304,240 00
New and renewed during 1886 .....	91	102,155 00
Gross number during 1886 .....	349	406,395 00
Less expired and cancelled in 1886 .....	83	90,480 00
Net risks in force on mutual system 31st December, 1886 .....	266	315,915 00

## CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

## PREMIUM NOTES OR UNDERTAKINGS

*On Policies in force 31st December, 1886.*

	Three year risks.	Total.
	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment .....	6,318 30	6,318 30
Amount of all premium notes after deducting all payments thereon and assessments levied .....	4,983 02	4,983 02
Amount of premium notes received during the year 1886 .....	2,043 10	2,043 10

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 THE YARMOUTH MUTUAL FIRE INSURANCE COMPANY.

HEAD OFFICE, SOUTH-WEST CORNER LOT NUMBER 7, CON. 9, TOWNSHIP OF YARMOUTH.

*Commenced business 17th October, 1881.**President*—JOHN A. SQUANCE.*Secretary*—W. E. LEONARD.

Unassessed premium note capital, \$7,418.23.

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 ASSETS.

Actual cash on hand at head office.....	\$13 87	
Cash on deposit to the Company's credit, not drawn against, in Southern Loan and Savings Company, St. Thomas .....	209 22	
		<u>\$223 09</u>
Amount of premium notes in force, after deducting all payments thereon and assessments levied .....		7,418 23
Total assets .....		<u>\$7,641 32</u>

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 LIABILITIES.

Amount of loss supposed.....	\$23 40
Sundries .....	1 00
Total liabilities .....	<u>\$24 40</u>

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 RECEIPTS.

Cash at head office, as per last statement (not extended).....	\$36 05
Cash received as first payments, being part payment of premium notes....	\$361 38
“ for assessments levied before 1886.....	11 76
“ from transfer fees, etc.....	16 50
“ for interest.....	4 37
Total receipts .....	<u>\$394 01</u>

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 EXPENDITURE.
*Expenses of Management:*

Amount paid for statutory assessment or certificate.....	\$12 74
“ printing, stationery and advertising.....	3 40
“ postage, telegrams and express.....	1 91
“ salaries, directors' and auditors' fees.....	164 00
Total expenses of management .....	<u>\$182 05</u>

*Miscellaneous:*

Cash paid for losses which occurred during 1886 .....	\$21 14
“ rebate .....	3 78
Total expenditure .....	<u>\$206 97</u>

CURRENCY OF RISKS.

Amount covered by Policies in force 31st December, 1886.

SYSTEM.	One year or less.	Over one but under two years.	Over two but under three years.	Three years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Mutual . . . . .	2,450 00	4,450 00	8,575 00	468,747 00	484,222 00

MOVEMENT IN RISKS.

Mutual System.

	Number.	Amount.
		\$ c.
Policies in force 31st December, 1885. . . . .	334	446,722 00
" new and renewed during 1886. . . . .	114	155,065 00
Gross number during 1886. . . . .	448	601,787 00
Less expired and cancelled in 1886 . . . . .	90	117,565 00
Net risks in force 31st December, 1886. . . . .	358	484,222 00

CLASSIFICATION OF RISKS:

Farm and Non-hazardous.

PREMIUM NOTES OR UNDERTAKINGS

On Policies in force 31st December, 1886.

	One year risks or under.	Over one but under two year risks.	Over two but under three year risks.	Three years.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Amount of face of all premium notes held by Company, and legally liable to assessment. . . . .	12 42	44 26	131 52	9,128 79	9,316 99
Amount of all premium notes, after deducting all payments thereon and assessments levied. . . . .	10 87	38 72	111 03	7,257 61	7,418 23
Amount of premium notes received during the year 1886 . . . . .	12 42	44 26	91 88	2,743 15	2,891 71





nt of Losses sustained in each locality.

Locomotive.	Matches.	Oils and varnish.	Picker.	Plumbing, care- less.	Spontaneous combustion.	Stoves and stove pipes.	Threshing machines.	Tobacco smoking.	Tramps.	Wooden fire- board.	Wood in stove oven.	Not stated.	Total Number of Fires.	Amount of Loss.	LOCALITY.
							1					1	3	\$ 1,420 00	Adelaide.
												1	3	1 203 44	Albion.
												1	2	85 70	Grey.
												1	2	58 29	Guelph.
												1	2	196 10	Guelph Township.
												1	1	200 00	Guild.
												1	1	400 00	Gwillimbury.
												1	1	5 00	Haldimand.
												1	1	3 00	Hallowell.
		2		1		1	1					14	32	17,759 25	Hamilton.
												3	6	2,327 37	Hanover.
												2	7	3,585 25	Harriston.
												1	1	500 00	Hay Township.
												3	6	7,040 40	Hensall.
							1					1	1	15 00	Hepworth.
						1						2	2	228 50	Hibbert Township.
												2	2	51 86	Highgate.
												1	1	10 00	Hillier.
												1	1	209 51	Hillsburgh.
									1			1	1	400 00	Howard.
1												4	4	1,273 00	Howick.
												3	3	1,095 20	Huron.
												4	7	6,989 97	Ingersoll.
												1	1	350 00	Iona.
												1	1	8 00	Iroquois.
						2						1	4	110 00	Kincardine.
												1	1	4 00	King.
						1						1	2	165 00	Kingston.
												1	1	28 00	Kingston Township.
												1	1	900 00	Kirkton.
												1	1	318 00	Knapdale.
												1	1	35 00	Lieury.
												2	2	3,151 70	Lindsay.
												1	1	20 10	Lion's Head.
1												2	2	663 00	Logan Township.
											1	3	3	119 00	Lobo.
						1						4	18	4,329 00	London.
												7	7	1,117 91	London Township.
												2	3	854 32	Lucan.
												1	1	50 00	Lucknow.
						1						1	3	625 30	Luther.

# FIRE-LOSSES PAID

1886 showing Months of Occurrence and Causes of Fires, also Amount of Losses sustained in each Locality

Month of Occurrence												Cause of Fire												Total Number of Fires	Amount	Locality																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Lighting	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves				Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stoves	Stove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Locomotive.	Matches.	Oils and varnish.	Picker.	Plumbing, care- less.	Spontaneous combustion.	Stoves and stove pipes.	Threshing machines.	Tobacco smoking.	Tramps.	Wooden fire- board.	Wood in stove oven.	Not stated.	Total number of Fires.	Amount of Loss.	LOCALITY.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	£ 0 0	Usborne.	
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	10 00	Uxbridge.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2,100 00	Vesta.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	109 86	Vienna.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	86 00	Vittoria.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	2 00	Wallace.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	157 00	Wallacetown.	
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	1	400 00	Wallbridge.	
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	3	38 25	Walpole Township.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	15 00	Wardsville.	
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	507 28	Warwick Township.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	7	2,219 35	Waterloo.
.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2	6	3,822 50	Waterloo Township.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	220 00	Watford.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3	835 64	Wawanosh, West.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	510 00	Welland.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	3	1,904 00	Wellesley Township.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	1,185 00	Wendigo.
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	4	6	1,167 58	Westminster Township.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	210 00	Whitby.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	7 50	White Church.
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2	2	23 00	Williams, East.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	21 75	Wilmot Township.
.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	222 75	Windsor.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	202 35	Woodstock.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	32 00	Woolwich.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	1,021 14	Yarmouth.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	6 00	Yatton.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	9 00	Yonge.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	7	1,929 00	Zorra.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	3	3,349 00	Not stated.
7	4	19	2	4	4	50	13	4	5	....	1	294	818	\$274,145 56		

## FIRE-LOSSES PAID—continued

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RECAPITULATION  
OF  
ASSETS, LIABILITIES, INCOME AND EXPENDITURE  
OF ALL  
STRICTLY MUTUAL FIRE INSURANCE COMPANIES.

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## PURELY MUTUAL FIRE INSURANCE COMPANIES.

ASSETS FOR THE YEAR ENDING 31st DECEMBER, 1886.

NAME OF COMPANY.	Real Estate, Cash Value.		Mortgages, Bonds, De- bentures, and other Securities.		Cash.		Agents' Balances.		Assessments Unpaid of 1886.		Bills Receivable, less than one year overdue.		Unassessed Premium Note Capital.		Interest Due and Accrued.		All other Assets.		Total Assets.	
	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.
Bay of Quinte					105	62			133	36			14,549	27					14,788	25
Bertie and Willoughby					50	67							10,104	87					10,155	54
Blanchard					87	67			185	00			15,605	25					15,877	92
Blenheim, North													38,083	85					38,083	85
Brant County					589	10			1,135	79			90,514	12					92,239	01
Bruce, West					20	35							17,385	14					17,405	49
Canadian Millers					5,866	73			187	50			27,327	72					33,381	95
Caradoc					25	87			46	34			8,767	65					8,839	86
Culross					107	69			133	91			17,553	14					18,155	54
Dominion Grange (General Branch			1,450	00	761	00					1,211	97	25,283	88	180	19			30,387	04
(Grange Branch	4,284	13	12,450	00	3,225	27					3,396	04	112,251	82	668	79	1,926	13	138,202	18
Dorchester, North and South					1,987	14			52	56			8,525	82					10,505	52
Dowrie					77	51			5	31			14,145	53					14,228	35
Dumfries, North, and Waterloo, South					473	75			486	12			167,246	25					168,206	12
Dunwich													11,524	29					11,524	29
Easthope, South					49	23							73,166	77					73,216	00
Economical					31	572	42	105	05	1,931	68	642	84	153,030	00	730	27	188,312	26	
Elma									64	37			17,646	19					17,710	56
Eramosa					3,182	98			123	30			13,041	87					16,348	15
Erie					101	09			60	31	205	00	13,521	52					13,887	92
Formosa					1,080	95			27	32	106	10	19,044	82					20,259	19
Germania													18,329	86					18,334	06
Globe			4	20	136	68			1,913	09	61	48	10,937	28					13,051	53

Grand River	627 44	60 50	136 28	5,595 99	7 00	6,290 93
Grey and Bruce	2,439 75			13,233 42		15,809 40
Guelph Township	779 05			20,109 32		20,888 57
Hay						
Hopewell Creek	128 86			49,339 14		49,768 00
Howick	732 89			51,927 66		52,827 32
Huron and Middlesex	1,722 98			133,931 51		136,170 36
	755 70	1,208 66	1,613 15	48,175 78	34 00	51,157 03
Laambon	6,635 58			25,012 20		32,612 98
Lennox and Addington	157 97			4,674 89		5,070 51
Lobo	1,356 53			13,145 86		14,551 11
London Township	400 09			13,978 72		14,526 86
McGillivray	193 77			8,003 76		10,241 13
McKillop	377 41			45,606 56		46,178 97
Nichol	117 62			63,240 06		65,148 31
Nissouri Farmers	1,382 34			68,961 72		71,200 76
Norfolk	672 57	70 39	157 54	10,494 93		11,515 78
Ononda	146 73			9,680 08		9,826 81
Oxford	43 63			24,128 54		24,173 17
Peel County	101 96			33,060 86		34,438 55
Pushbuck	612 19			7,918 03		8,580 22
Saltfleet and Limbrook						
Saugen	332 85	2 64	37 61	5,587 96		6,000 94
Simcoe	1,457 65			37,275 71		42,493 52
Southwell	130 50			5,097 21		5,368 36
Sydenham	130 17			8,285 69		8,525 76
	1,806 44	175 19		39,654 33		41,120 08
Townsend	323 11			13,464 97		13,801 08
Usborne and Hilbert	104 45			27,291 64		27,888 16
Victoria	139 15			30,733 97		32,288 36
Wahdoe	928 84	64 54		25,329 97		26,323 35
Waterton, North	619 06			110,285 43		111,797 45
Wawanosh, West	88 69			81,627 78		82,232 29
Wallington	13,489 80	330 38		344,284 58		360,578 35
Westminster	7,467 61			18,099 60		25,567 21
Williams, East	956 28	18 10		4,983 02		6,085 58
Yarmouth	223 09			7,418 23		7,641 32
Total	97,717 46	2,395 45	9,705 45	2,308,225 63	1,613 25	2,405,847 96

## PURELY MUTUAL COMPANIES.

LIABILITIES FOR THE YEAR ENDING 31st DECEMBER, 1886.

NAME OF COMPANY.	LOSSES.			Borrowed Money.		Salaries and Directors' Fees.	Small Accounts.	Total Liabilities.		Number of Policies in Force.	Amount at Risk.	
	Adjusted.	Resisted.	Reported but not Adjusted.	£	c.	£	c.	£	c.		£	c.
Bay of Quinte .....	580 00			300 00				300 00		792	1,000,405 00	
Bertie and Willoughby .....	2,882 00			1,545 00			65 70	4,492 70		551	671,929 00	
Blenheim, North .....				150 00			9 04	139 04		365	796,520 00	
Brant, County .....	1,550 00			600 00				2,150 00		360	770,950 00	
Bruce, West .....				700 00		87 00	27 25	814 25		1,439	3,367,746 00	
										345	405,525 00	
Canadian Millers' .....								<i>nil.</i>		177	391,900 00	
Caradoc .....				350 00				350 00		272	312,271 00	
Cutloss .....								<i>nil.</i>		544	498,436 00	
Dominion Grange, { General Branch	225 00							<i>nil.</i>		1,774	1,713,537 00	
Dorchester, North and South .....								879 95		5,704	5,891,511 00	
Downton .....						96 00		96 00		685	990,876 00	
Dumfries, North, and Waterloo, South .....								<i>nil.</i>		283	461,680 00	
Dunwich .....				110 75		99 33		<i>nil.</i>		1,583	3,670,976 00	
								210 08		197	554,025 00	
Easthope, South .....								<i>nil.</i>		860	1,553,830 00	
Economical .....	600 00		400 00					1,000 00		3,807	3,753,111 00	
Elan .....						52 34		52 34		274	372,011 00	
Eranosa .....								<i>nil.</i>		204	396,760 00	
Erie .....								<i>nil.</i>		583	635,805 00	
Fornosa .....								<i>nil.</i>		621	642,792 00	
Germania .....				1,200 00		211 40		<i>nil.</i>		610	771,345 00	
Globe .....			1,340 00					2,751 40		1,232	765,278 00	

Grand River .....							<i>nil.</i>		307	412,535 00
Grey and Bruce .....							<i>nil.</i>		653	687,611 00
Thelph, Township .....							<i>nil.</i>		271	479,790 00
Hay, Township .....	1,254 00							1,254 00	1,361	1,821,202 00
Hopewell Creek .....								<i>nil.</i>	876	981,809 00
Howick .....		600 00						600 00	2,306	3,008,897 00
Huron and Middlesex .....	3,808 58							3,931 27	2,762	1,907,980 00
Lambton .....								<i>nil.</i>	2,578	2,787,971 00
Leamox and Addington .....								<i>nil.</i>	416	365,521 00
Lobo, .....								<i>nil.</i>	288	333,270 00
London Township .....								520 40	582	721,481 00
McGillivray .....								<i>nil.</i>	327	333,540 00
McKillop .....								<i>nil.</i>	1,535	2,059,193 75
Nichol .....	900 39							3,550 39	1,456	1,946,407 00
Nissouri .....	372 80							3,178 40	931	1,553,326 00
Norfolk .....	400 00							901 89	1,179	1,063,638 00
Oneida .....								<i>nil.</i>	340	445,394 00
Oxford .....		10 00						2 42	532	649,725 00
Peel County .....	5 00							5 00	2,024	2,933,604 00
Preslinch .....								<i>nil.</i>	253	462,650 00
Saltfleet and Bimbrook .....								28 00	326	385,357 00
Saugen .....								30 50	1,651	1,289,166 00
Simcoe .....								<i>nil.</i>	164	220,082 83
Southwold .....	1,800 00							1,800 00	484	697,200 00
Sydenham .....								<i>nil.</i>	1,884	2,100,969 00
Townsend .....								<i>nil.</i>	671	966,455 00
Usborne and Hibbert .....								<i>nil.</i>	1,171	1,631,755 00
Victoria .....								1,336 60	981	1,135,179 00
Walpole .....	300 00							300 00	783	1,242,126 00
Waterloo, North .....	1,600 00							1,600 00	1,325	2,415,174 00
Wawanosh, West .....								<i>nil.</i>	1,732	2,193,159 00
Wallington .....	2,317 34							39 72	2,786	3,516,054 00
Westminster .....								<i>nil.</i>	820	1,162,110 00
Williams, East .....								<i>nil.</i>	296	315,915 00
Yarmouth .....								24 40	358	484,222 00
Total .....	18,595 11	540 00	6,066 90	20,443 72	1,534 10	1,109 46	48,229 59	60,341		75,375,688 58





Grand River	169 32	20 21	6 00	237 53
Grey and Bruce	367 38	75 60		977 84
Chelph Township	534 86	35 60		280 83
	254 23			
Hay Township	240 45	30 40		270 85
Hopewell Creek	8 25		4 50	2,227 57
Hovick	4,016 02	16 42	5 22	5,841 28
Huron and Middlesex	12,063 14	87 65	94 35	246 00 19,292 01
Lambton	6,753 46	235 22	2,100 00	5 13 9,093 81
Lennox and Addington	728 24			1,162 89
Lobo	465 03	40 89	8 75	776 21
London Township	1,113 27	2 64	2 40	1,659 23
McGillivray		130 45	2,135 00	2,428 70
McKillop	2,448 39		7 00	2,968 39
Nichol	822 62	20 93		18,020 86
Niesson Farmers'	190 00		624 02	5,229 33
Norfolk	1,420 74	16 96	15 00	600 00
	832 95			
	1,275 00			
Oreida			13 50	115 50
Oxford	152 00			1,407 22
Peel County	1,182 83		4 35	7,170 46
Paslinch	174 97	19 72		1,077 63
Saltfleet and Binbrook	295 09			549 65
Saugeen	1,474 16	31 42		8,300 80
Simcoe	2,875 79		98 25	349 65
Southold	211 95			1,968 15
Sydenham	1,255 30			2,574 24
	824 66	67 42	55 00	
Townsend				430 54
	237 18			
Usborne and Hibbert	1,509 86	88 22		1,830 53
Victoria	1,409 81	23 85	33 80	7,573 87
Walpole	233 06	24 13		513 57
Waterloo, North	4,474 06			10,268 32
Wawanosh, West	3,363 96			3,444 06
Wellington	14,036 84	407 57	31 88	28,231 16
Westminster	9,003 31	337 60	57 08	374 49
Williams, East	2,130 95	364 35		2,653 46
		18 70		657 03
Yarmouth	311 44			
			16 50	394 01
	361 38			
Total	65,646 75	4,808 41	7,206 62	9,869 98
	2,465 74		762 96	31,444 31
			921 38	246,190 72



## PURELY MUTUAL FIRE INSURANCE COMPANIES.

EXPENDITURE FOR YEAR ENDING 31st DECEMBER, 1886.

NAME OF COMPANY.	Losses.		Reinsurance.		Refunds, Rebate and Returned Premiums.		Repayment of Loans.		Investments.		General Expense Account.		Agents' Commissions, etc.		Law and Division Court Costs.		Interest.		Statutory Assessment.		All Other Expenditures.		Total.	
	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.	£	c.
Bay of Quinte .....	1,473	70			6	48	400	00			535	15	150	50			6	04	27	08			2,598	95
Bertie and Willoughby .....	6	00			1	16					380	92	213	00					16	77			623	85
Blanshard .....	2,882	00					757	00			107	30			13	00	27	88	22	57			3,809	75
Blenheim, North .....	13	75									202	48					10	50	20	84			247	57
Brant County .....	3,713	92					2,300	00			864	00	563	67	26	23	54	77	85	37			7,388	16
Bruce, West .....	754	20									164	45	5	68					1	41	86	21	1,031	25
Canadian Millers' .....	3,667	02	614	00	67	62					1,092	88	10	80					8	10	35	00	5,495	42
Canadoc .....	1,500	04			13	63					147	15	105	50					5	19			1,861	81
Culross .....	35	00									155	00	147	00					13	85			350	28
Dominion Grange, General Branch .....	3,126	13	18	80	86	00					2,096	81	190	25					46	01			5,564	03
"    Grange .....	4,554	90	133	85	1,526	37			600	00	7,833	97	562	25	5	04			168	68			15,384	46
Dorchester, North and South .....	1,612	45			2	58					304	40							25	00			1,944	43
Downie .....	530	00					500	00			32	43	98	40			20	00	9	23			1,190	56
Dunfries N. and Waterloo S. ....	1,323	00									1,022	61			11	00			100	79			2,457	40
Dunwich .....	37	60							200	00	139	63					21	33	15	32			413	28
Easthope, South .....	83	00							25	00	309	00							41	38			458	38
Economical .....	18,630	20	152	12	188	51					4,084	42	1,692	00					92	59			24,749	84
Elma .....	725	00									129	15							7	91			862	06
Erasmus .....	5	00									105	32							10	79			121	31
Erie .....	713	00									190	14	88	40					17	31			1,608	85
Formosa .....											158	25	103	00					12	61			273	86
Germania .....					59	80					689	53	477	39	7	35			19	97			83	40
Globe .....	5,257	71																	22	13			6,506	56

Grand River Grey and Bruce Township	127 80 32 16	1 30	299 64 227 23 73 30	...	...	11 80 19 08 13 09	221 41 374 11 109 69
Hay	1,016 67		260 60	12 75	24 43	17 60	1,354 80
Hopewell Creek	619 60	530 00	296 18	126 00	28 00	21 05	1,636 41
Howick	3,143 75	1,131 50	961 02	2,109 41	101 49	82 48	5,475 75
Huron and Middlesex	11,214 42	702 00	1,803 63	...	...	53 63	19,524 55
London	3,549 50	16 50	760 38	528 30	...	72 12	7,035 35
Lennox and Addington	12 00	1,300 00	390 72	111 50	70 50	14 68	1,929 40
Lobo	113 00	4 86	110 08	53 00	...	9 00	289 94
London Township	1,113 91		58 38	150 85	...	17 04	1,340 18
Metcalvey	300 00	3 60	64 00	17 50	...	9 08	394 18
McKillop	1,708 00	1 10	642 59	...	3 10	59 18	2,620 97
Nichol	7,507 10	9 01	1,015 67	591 00	186 64	61 78	20,271 20
Niassour, Farmers	3,293 00	10,900 00	370 22	40 00	...	41 63	3,896 99
Norfolk	1,779 00	21 93	768 00	92 75	10 00	31 56	1,069 49
Opeida	10 50		99 25	...	...	12 27	122 02
Oxford	696 00	396 45	241 40	...	16 33	13 11	1,863 59
Peel County	1,082 24	950 00	1,723 45	370 00	6 05	74 64	7,206 88
Paslinch	893 80		56 75	23 00	...	11 88	985 43
Saltfleet and Binbrook	13 00	50 00	166 13	19 50	81	10 89	260 36
Sanger	3,316 18	150 00	1,142 70	1,316 65	565 79	38 40	6,843 15
Simcoe	5 00	59 23	159 42	...	...	5 50	229 15
Southwold	1,104 00	350 00	311 87	...	16 00	18 82	2,003 79
Sydenham	1,738 90		452 62	10 00	...	51 81	2,253 33
Townsend	40 00		300 87	...	...	26 13	367 00
Usborne and Hibbert	1,574 00	225 00	299 38	...	5 25	39 25	2,142 80
Victoria	2,924 04		3,110 82	1,051 81	112 07	32 38	7,613 37
Walpole	38 25		324 45	91 50	...	33 75	490 45
Waterloo, North	3,356 50	3,522 50	678 41	...	63 50	66 66	9,687 37
Wawanosh, West	1,654 64	1,000 00	725 69	...	81 28	47 07	3,510 37
Wellington	11,520 00	1 69	4,385 31	3,650 29	68 89	91 51	20,115 89
Westminster	1,167 58	1 88	601 85	5 30	...	33 18	1,809 79
Williams, East	23 00	5 85	96 10	...	...	8 63	133 68
Yarmouth	21 14	3 78	169 31	...	...	12 74	206 97
Total	122,492 47	1,259 80	3,485 96	26,277 80	2,825 00	1,428 52	222,416 00

## FIRE INSURANCE.—MUTUAL COMPANIES OF ALL CLASSES.

COMPARATIVE SUMMARY OF ASSETS AND PREMIUM NOTES FOR YEAR ENDING 31ST DECEMBER, 1866.

NAME OF COMPANY.	Gross Amount at Risk on Mutual Plan.	Premium Notes un- assessed amount.	Surplus of General As- sets over Liabilities.	New Business taken during year 1866.	Premium Notes taken during year 1866.	Rate per cent. of said Business Notes.	Terms of Insurance in years.
Bay of Quinte.....	1,060,065 00	14,549 27	14,488 25	395,455 00	6,361 56	1.60	3
4 Bertie and Willoughby.....	671,925 00	10,104 87	9,575 54	336,437 00	5,322 65	1.38	3
Blanchard.....	796,520 00	15,665 20	11,385 22	321,880 00	7,747 50	2.41	3
Blenheim, North.....	770,950 00	38,083 85	37,924 81	203,550 00	10,177 50	5.00	5
Brant County.....	3,367,746 00	90,514 12	90,089 01	1,088,455 00	32,320 23	2.97	5
Bruce, West.....	165,525 00	17,885 14	15,591 21	316,175 00	12,482 00	3.95	3
Canadian Millers'.....	367,900 00	29,481 72	33,381 45	159,300 00	17,758 50	11.82	3
Canadoc Farmers'.....	342,271 00	8,767 65	8,489 86	179,251 00	5,377 83	3.00	3
City Mutual, of London.....	355,019 00	11,266 91	13,296 01	383,219 00	15,462 27	1.03	1, 2, 3
Culross.....	198,435 00	17,553 94	18,155 54	232,472 00	9,345 20	1.01	3
Dominion Grange, General Branch.....	1,743,537 60	26,283 88	30,387 01	579,698 00	11,611 66	2.01	1, 2, 3, 4
"    Grange.....	5,861,511 00	112,251 82	137,322 53	1,617,026 00	11,165 32	2.35	1, 2, 3, 4
Dorchester, North and South.....	990,876 00	8,525 82	9,469 52	285,510 00	3,710 20	2.00	3
Dowrie.....	161,680 00	14,145 53	11,228 35	148,915 00	7,475 75	5.02	5
Dunfries, North, and Waterloo, South.....	3,670,976 00	167,246 25	168,236 12	812,860 00	31,354 25	4.23	5
Dunwich.....	551,626 00	11,524 29	11,314 21	156,650 00	3,916 31	2.50	3
Easthope, South.....	1,533,830 00	73,166 77	73,216 77	407,780 00	29,389 00	3.00	3
Economical.....	3,753,111 00	134,597 00	187,312 26	1,519,302 00	5,230 00	5.30	3
Elina Farmers'.....	372,011 00	17,646 19	17,638 22	109,343 00	5,467 15	5.00	3
Erasmus.....	396,760 00	13,041 87	13,041 87	116,375 00	5,317 30	4.57	3
Erie.....	635,805 00	13,521 52	13,887 92	170,620 00	4,367 25	2.56	5
Formosa.....	642,722 00	19,011 82	20,259 19	293,462 00	9,092 60	3.10	3
Germania.....	771,345 00	18,329 86	18,334 06	156,650 00	3,867 65	2.17	5
Globe.....	765,278 00	10,937 28	10,300 13	257,775 00	6,181 11	2.40	1, 3
Gore District.....	2,547,612 19	137,089 31	206,166 23	1,112,338 00	90,110 00	8.10	1, 2, 3
Grand River.....	412,535 00	3,555 99	6,269 93	292,110 00	3,619 20	1.51	3
Grey and Bruce.....	687,611 00	13,293 42	15,809 40	133,172 00	2,269 91	1.48	1, 2, 3, 4, 5
Guelph.....	179,790 00	20,109 32	20,888 37	170,600 00	8,115 50	4.76	3

Hand-in-Hand	676,321 00	8,737 10	12,805 08	653,753 00	8,389 67	1 27	1, 3
Hay Township	1,821,202 00	49,339 14	48,514 00	186,965 00	14,086 50	2 89	5
Hopewell Creek	981,809 00	32,827 66	32,827 32	367,330 00	19,915 10	5 42	5
Howick	3,068,897 00	138,931 51	133,570 36	553,797 00	28,239 75	3 08	5
Huron and Middlesex	1,907,980 00	48,804 66	48,255 76	911,978 00	36,529 79	4 01	1, 3
Lambton	2,787,971 00	25,012 20	32,612 98	1,137,621 00	17,023 40	1 50	3
Lennox and Addington	365,521 00	4,674 89	5,070 51	143,736 00	2,676 52	1 91	3
Lobo	350,270 00	13,145 86	14,551 11	107,405 00	4,202 30	4 00	1, 2, 3
London Township	721,481 00	13,978 72	11,006 46	162,356 00	2,926 31	1 80	3, 4, 5
McGillivray	333,540 00	8,003 76	10,241 13	27,125 00	813 75	3 00	3
McKillop	2,059,193 75	45,606 56	46,178 97	767,410 00	20,200 79	2 63	3, 5
Millers' and Manufacturers'	742,018 00	14,782 15	36,098 25	881,225 00	17,755 38	2 01	1, 3
Nichol	1,946,407 00	63,240 06	61,597 92	338,175 00	20,762 24	3 81	5
Nissouri Farmers'	1,353,326 00	68,961 72	68,022 36	419,730 00	20,985 50	5 00	5
Norfolk Farmers	1,093,638 00	10,494 93	10,613 89	329,440 00	4,874 95	1 48	1, 2, 3
Oneida	445,394 00	9,680 08	9,826 81	153,095 00	3,714 26	2 43	3, 5
Ontario	1,212,253 00	12,589 01	7,064 30	460,420 00	12,946 16	2 62	3
Oxford	649,725 00	24,129 51	23,800 75	197,400 00	7,198 00	4 03	2, 3, 4, 5
Peel County	2,953,601 00	33,060 86	34,433 55	1,073,445 00	22,481 33	2 09	4
Perth	3,251,514 00	74,108 41	88,085 47	1,319,503 00	57,174 11	4 33	1, 3
Puslinch	462,650 00	7,949 23	8,530 22	.....	3,636 90	.....	3
Saltfleet and Binbrook	385,357 00	5,587 96	5,972 94	150,257 00	2,263 90	1 51	2, 3
Saugen	1,280,666 00	37,496 91	31,839 49	390,861 00	.....	.....	1, 3
Simcoe County	220,082 83	5,097 21	5,338 36	84,547 00	2,925 60	3 46	3, 4, 5
Southwold	657,200 00	8,285 69	6,725 76	94,350 00	1,887 00	2 00	3
Sydenham	2,100,969 00	39,654 33	41,190 08	833,613 00	17,303 37	2 08	1, 2, 3, 4, 5
Townsend	966,455 00	13,461 07	13,801 08	363,295 00	5,927 56	1 63	3
Usborne	1,631,755 00	27,291 61	27,888 16	509,150 00	11,161 33	2 19	5
Victoria	1,195,179 00	30,733 67	30,351 76	112,815 00	13,686 98	3 32	3
Walpole	1,242,126 00	25,329 97	26,023 35	292,129 00	6,317 69	2 16	1, 2, 3, 4, 5
Waterloo	3,697,399 67	199,251 42	199,622 81	1,511,311 00	107,535 24	7 10	3
Waterloo, North	2,415,174 00	110,285 13	110,192 45	529,915 00	27,066 00	5 11	5
Wawanesa, West	2,193,159 00	81,627 78	82,292 29	867,030 00	34,681 20	4 00	5
Wellington	3,516,054 00	344,281 58	358,041 29	1,116,854 00	161,097 24	11 58	3
Westminster	1,162,110 00	18,099 60	25,567 21	305,010 00	6,100 30	2 00	5
Williams, East	315,915 00	1,983 02	4,065 58	102,155 00	2,043 10	2 00	3
Yarmouth	481,222 00	7,418 23	7,616 92	155,065 00	2,891 71	1 86	1, 2, 3
Total	87,685,515 41	2,735,683 38	3,015,296 98	30,803,956 00	1,297,749 76	.....	.....



INDEX REGISTER OF FIRE INSURANCE COMPANIES, INCLUDING ALL COMPANIES AUTHORIZED TO  
TRANSACTION BUSINESS AT THE DATE OF PUBLICATION OF THIS REPORT.

Page.	NAME OF COMPANY.	System.	Head Office.	President.	Post Office.	Secretary.	Post Office.
52	Bay of Quinte Agricultural	Mutual	Pictou	Arch. Southard	Pictou	J. Roland Brown	Pictou.
53	Berkie and Willoughby Farmers'	Mutual	Ridgeway	W. E. Blaworth	Ridgeway	H. N. Hibbard	Ridgeway.
57	Blandford	Mutual	Woodham	W. T. Sanderson	St. Mary's	Wm. Johnston	Woodham.
59	Bluelien, North	Mutual	Cheslerfield	Thos. Lockhart	Wahner	Geo. Middleton	Cheslerfield.
61	Brant County Farmers	Mutual	Paris	M. Freeman	Princeton	Wm. Turnbull	Paris.
63	Bruce, West, Farmers	Mutual	Kincardine	Robt. Baird	Kincardine	Geo. Bissett	Kincardine.
65	Canadian Millers'	Mutual	Hamilton	D. Goldie	Ayr	Seneca Jones	Hamilton.
68	Caradoc Farmers'	Mutual	Mount Brydges	W. Young	Mount Brydges	Wm. E. Sawyer	Mt. Brydges.
71	City Mutual of London	Cash-Mutual	London	James Cowan	London	Hugh Vallance	London.
70	Culross.	Mutual	Treewater	Thos. Allison	Treewater	Alex. Adamson	Treewater.
78	* Dereham and W. Oxford	Mutual	Mt. Elgin	Jesse Trull	Oshawa	T. R. Mayberry	Salford.
78	Dominion Grange	Mutual	Owen Sound	Wm. Woods	Cramlin	R. J. Doyle	Owen Sound.
79	Dorchester, North and South.	Mutual	Harrietsville	Jas. Ballantyne	Sebringville	Francis Kimz	Harrietsville.
80	Downie	Mutual	St. Paul's	S. Hall	Sebringville	Peter Smith	Sebringville.
82	Dumfries, N., and Waterloo, S.	Mutual	Ayr	Wm. Deans	Washington	Wm. Deans	Galt.
84	Dunwich Farmers'	Mutual	Wallacetown	P. Stalker	Criman	John L. Pearce	Wallacetown.
86	Easthope, South, Farmers'	Mutual	Tavistock	Werner Youngblut.	Tavistock	Robert Reid	Tavistock.
88	Economical	Mutual	Berlin	Hugo Krausz	Berlin	W. Oelschlaeger	Berlin.
91	Elma Farmers'	Mutual	Atwood	Wm. Shearer	Listowel	Robert Cleland	Listowel.
93	Eramosc.	Mutual	Rockwood	David Rea	Fergus	Hugh Black	Rockwood.
95	Erie Farmers	Mutual	Selkirk	Guy Culver	Ranham Centre.	J. W. Hohaus	Selkirk.
97	* Fire Insurance Exchange	Mutual & Guarantee	Toronto	Fred. Wild	Toronto	Hugh Scott	Toronto.
	Formosa	Mutual	Formosa	Andrew Waelcher	Walkerton	Julius Noll	Formosa.
99	Germania Farmers'	Mutual	Lot 4, con. 8, Normandby.	John Roedding	Alsfeldt	Geo. Hoff	Moltke.
101	Globe	Mutual	Brantford	John Strickland	Brantford	Edwin Sims	Brantford.
101	Gore District	Cash-Mutual	Galt	Hon. J. Young	Galt	R. S. Strong	Galt.
101	Grand River	Mutual	York	Wm. H. Holl	Caledonia	F. A. Nelles	York.
106	Grey and Bruce	Mutual	Hapover	David McMichael	Lamash	Duncan Campbell	Hapover.
108	Guelph Township	Mutual	Guelph	John Holson	Mosborough	Wm. Whitelaw	Guelph.
28	Hand-in-Hand	Mutual and Stock	Toronto	W. H. Howland	Toronto	Hugh Scott	Toronto.
110	Hay Township Farmers'	Mutual	Zurich	Daniel Surans	Zurich	Henry Elber	Creighton.
112	Hopewell Creek	Mutual	New Germany	Joseph Springer	Kessuth	Anton Frank	New Germany.
114	Hovick Farmers'	Mutual	Corrie	James Edgar	Corrie	Thos. F. Miller	Wroxford.
116	Huron and Middlesex.	Mutual	London	L. C. Leonard	London	John Stephenson	London.

119	Lambton Farmers'	Mutual	Watford	George Dewar	Kertch	W. G. Willoughby	Wanut.
121	Jennies and Addington	Mutual	Napanee	John B. Aylsworth	Newburgh	C. James	Napanee.
123	Locho Township	Mutual	Arva	T. T. Turnbull	Konoka	Jacob Marsh	Coldstream.
125	London Township Farmers'	Mutual	Arva	Edward Roberts	Bryanston	E. Dunn	Bryanston.
127	McGillivray	Mutual	Lot 15, c. 11, West-McGillivray	Andrew Robinson	W. McGillivray	W. Fraser	W. McGillivray
129	McKillop	Mutual	Lot 17, con. 5, McKillop	Thos. E. Hays	Seaford	W. J. Shannon	Seaford.
129	Mercentile	Stock	Waterloo	J. E. Bowman	St. Jacobs	P. H. Sims	Waterloo.
32	Millers' and Manufacturers	Stock and Mutual	Toronto	James Goldie	Guelph	Douglas Sutton	Toronto.
131	Nichol	Mutual	Nichol	Wm. Taylor	Fergus	John Beattie	Fergus.
133	Nisouri Farmers'	Mutual	Kintore	John Ross	Embro	E. J. Pearson	Kintore.
135	Norfolk Farmers	Mutual	Simcoe	John Murphy	Silver Hill	W. Roberts	Simcoe.
137	Oneida Farmers'	Mutual	Town Hall, Oneida	David Kett	Willow Grove	John Sem	York.
35	*Ontario	Cash-Mutual	London	A. McCormick	London	P. F. Boyle	London.
37	*Ottawa	Mutual	Norwich	A. McCorquodale	Nisouri	H. J. Duger	Norwich.
139	Oxford Farmers	Mutual	Embro	John Patterson	Embro	Robert Murray	Embro.
141	*Peel and Maryborough	Mutual	Drayton	Thomas Holtby	Hollin	W. H. Stubbs	Drayton.
38	Peel County Farmers'	Mutual	Brampton	John Hyde, M.D.	Brampton	L. Cleyn	Brampton.
143	Perth County	Cash-Mutual	Stratford	D. McFarlane	Stratford	Chas Packert	Stratford.
143	Paslinch	Mutual	Aberfoyle	W. H. Howland	Aberfoyle	James Scott	Aberfoyle.
145	Queen City	Stock	Toronto	W. H. Howland	Toronto	T. Wahnsley	Toronto.
145	Saltfleet and Binbrook	Mutual	Elfrida	A. D. Lee	Stoney Creek	J. C. Hariss	Hamilton.
147	Saugen	Mutual	Mount Forest	James Murdoch	Yeovil	H. L. Drake	Mount Forest.
150	Simcoe County	Mutual	Keenansville	P. B. Skelly	Tottenham	T. R. Carmichael	Tottenham.
152	Southwold Farmers'	Mutual	Schldon	Donald Turner	West-Magdala	R. N. Stafford	Schldon.
154	Sydenham	Mutual	Amman	Gideon Harkness	Amman	Hugh Reid	Amman.
156	Townsend Farmers'	Mutual	Waterford	Oscar McMichael	Waterford	L. N. Colver	Waterford.
158	Uxborne and Hibbert	Mutual	Farquhar	Robert Gardiner	Farquhar	Alex. Duncan	Farquhar.
160	Victoria	Mutual	Hamilton	George H. Mills	Hamilton	W. D. Booker	Hamilton.
163	Walpole Farmers'	Mutual	Jarvis	Chas. Simon	Garnet	George Miller	Jarvis.
41	Waterloo	Cash-Mutual	Waterloo	Chas. Hendrie	Waterloo	C. M. Taylor	Waterloo.
165	Waterloo, North, Farmers	Mutual	Waterloo	B. J. Ballard	Hawkesville	L. Stauffer	Waterloo.
167	Wawanesa, West	Mutual	Dungannon	Chas. Givvin	Nile	J. M. Roberts	Dungannon.
169	Wellington	Mutual	Guelph	F. W. Stone	Guelph	Chas. Davidson	Guelph.
172	Westminster Township	Mutual	Lot 14, con. 4, Westminster	John H. Little	Leameth	Henry Anderson	Wilton Grove.
171	Williams, East	Mutual	Narn	N. McTaggart	Narn	Wm. McCallum	Narn.
176	Yarmouth	Mutual	Lot 13, con. 8, Yarmouth	W. L. Vansycle	Dexter	W. E. Leonard	St. Thomas.

\* Licensed on and from 1st July, 1887, to transact isolated and non hazardous Fire Insurance.





# R E P O R T

RELATING TO THE REGISTRATION OF

## BIRTHS, MARRIAGES AND DEATHS

IN THE

### PROVINCE OF ONTARIO

FOR THE YEAR ENDING 31ST DECEMBER,

1886.

Printed by Order of the Legislative Assembly.



Toronto:

PRINTED BY WARWICK & SONS, 26 & 28 FRONT STREET WEST.  
1887.



REGISTRAR GENERAL'S OFFICE, ONTARIO,  
TORONTO, December 1st, 1887.

*To His Honour Sir Alexander Campbell, K.C. M.G.,  
Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR :

In compliance with the Statute in that behalf, the undersigned respectfully presents to Your Honour the Annual Report of Births, Marriages and Deaths for the year ending 31st December, 1886.

Respectfully submitted,

ARTHUR S. HARDY,  
Registrar-General.



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# REPORT

## RELATING TO THE

# REGISTRATION OF BIRTHS, MARRIAGES AND DEATHS

IN THE

PROVINCE OF ONTARIO,

FOR THE YEAR ENDING 31ST DECEMBER, 1886.

PARLIAMENT BUILDINGS,

TORONTO, December 1st, 1887.

*To the Honourable A. S. HARDY,**Registrar-General, Province of Ontario.*

SIR,—I have the honour to present the Annual Report of the returns of Births, Marriages and Deaths registered in the Province for the year ending 31st December, 1886.

The total number of Births, Marriages and Deaths registered during the year was 83,487, as against 81,008 in 1885, an increase of 2,479, or 3 per cent.

There were 1,230 more births, 170 more marriages, and 1,079 more deaths registered.

The approximate rates for the year are as follows :

Births, 22.0 per 1,000 of estimated population.

Marriages, 6.5 per 1,000 of estimated population.

Deaths, 11.0 per 1,000 of estimated population.

The excess of Births over deaths, 11.0 per 1,000 of estimated population.

This shows that there was one birth to every 45.4 persons living, one marriage to every 76., and one death to every 91.2 living.

The population of the Province in 1886 is estimated to be 2,115,971, an increase of about ten per cent. over the population as given by the census of 1881, and has been used in making the calculations of the ratios, percentages, etc., for the whole Province. The following factors have been used to show how this estimated increase has been arrived at, and is believed in the absence of an annual census to be as reliable as can be devised :

Population by census of 1881.....	1,923,610
Increase from excess of births over deaths.....	111,013
Immigrants settled in the Province, according to the report of the Immigration Department.....	101,971

Total.....	2,135,971
------------	-----------

Deduct from this total the number of emigrants who left the Province, estimated at about .....	20,000
--	--------

Estimated population in 1886.....	2,115,971
-----------------------------------	-----------

The population of the Cities and Towns is taken direct from the Assessor's returns, and the calculations for these places based upon them.

## BIRTHS.

*(See Tables 1, 2 and 3).*

The usual abstracts from the full Tables of Births in the appendix will be found on pages 7 to 14.

The ratio of Births for the whole Province was	22.0	per 1,000.
“ “ “ Cities	27.0	“ “
“ “ “ Towns	22.7	“ “
“ “ “ Rural Districts	20.7	“ “

Twenty-eight out of the forty counties returned more births than in 1885, and twelve less. The increases were principally in the Counties of Carleton, York, Hastings and Lambton, and the decreases in Middlesex, Frontenac, Northumberland and Durham (united), and Peterborough.

In nearly all the Cities the number of Births appears to have increased, the exceptions were Kingston, which returned 81 less; Guelph, 8 less; and Belleville, 6 less.

Of the 24 Towns included in Table 3, thirteen gave a total increase of 209 births, and the remaining eleven showed a decrease of 171. The total returns therefore gave an increase of 38 births.

The proportion of births to population was as follows :

In the Province one to every 45.5 living.	
“ Cities “ “	33.8 “
“ Towns “ “	44.0 “
“ Rural districts “ “	48.2 “

## SEX.

*(See Table 4).*

There were 24,071 male births to 22,387 female, a difference of 1,684 in favour of the males. An excess of male over female births has always been shown in the returns from the Province in every month of the year. The largest excess was in January, 114 males to 100 females, and the smallest in June, 102 to 100; the average for the year was 107.5 to 100. In the eleven cities the male births numbered 4,436 to 4,092 female, 344 more, but the proportion between the sexes was more varied in the different months of the year than in the returns from the whole Province.

In the month of September the proportion of male to female births in the cities was 128 to 100, while in the month of November the proportion was slightly in favour of the females, being 100.8 females to 100 males.

## MONTHLY AND QUARTERLY.

*(See Tables 5, 6 and 7).*

The largest number of births always occur in March, and the smallest generally in November. The births in March exceeded those in November by 775.

The average number of births per month was 3,871, per week 893, and per day 128.

More births were recorded in the first quarter of the year than in any one of the other three, and the least in the third quarter, and with few exceptions this position was maintained in the quarterly returns since the Registration Act came into operation.

## PLURAL BIRTHS.

*(See Table 8).*

In 1886, 378 women gave birth to 759 children, of whom 750 were twin children, and nine triplets, showing an increase of 274 in the number of twins and a decrease in the number of triplets of twelve.

In proportion to the total number of births in each county, Oxford had the largest percentage of twin births, 2.7; Wellington and York nearly equal, 2.5. One case of triplets was reported from each of the Counties of Brant, Lennox and Addington and York.

## ILLEGITIMATE.

*(See Table 8).*

Of the 671 illegitimate births which took place in the Province, 190 of them, or 28.1 per cent occurred in the County of Carleton. The proportion of these births to the whole number in the county was 7 per cent. This illegitimate birth rate in Carleton, in which Ottawa is situated, was exceptionally high. The largest percentage of these births in the other counties was in those counties in which the cities were situated, viz.: York 4 per cent., Wentworth 3 per cent., Middlesex 1.5 per cent., Brant 1.7 percent., and Lincoln 1.3 per cent.

## MARRIAGES.

*(See Tables 1, 2 and 3).*

The number of marriages reported as having been celebrated in the Province during the year 1886 was 13,845, an increase of 170. In the eleven cities, 3,300 marriages were celebrated, an increase of 222, and the 24 towns returned 1,376 marriages, 66 less than in 1885. The ratio per 1,000 living of these marriages was much larger in the cities and towns than in the rural districts. In the cities it was 11.04 per 1,000; in the towns 11.3 per 1,000—In the rural districts it was only 5.4 per 1,000. The proportion to population was one marriage to every 90 of the living in the cities; one in every 89 in the towns, and one in every 184 in the rural districts.

## DENOMINATIONS.

*(See Table 9).*

Methodists again head the list in this Table with increased numbers, nearly 40 per cent. of all the persons married in 1886 were Methodists. Those registered as Presbyterians when married numbered more in 1886 than in 1885 by 521. They were 21.9 per cent. of the whole. The Table also shows that fewer marriages were registered by Episcopalians, Roman Catholics, Baptists, Lutherans, and those belonging to the Evangelical Association; while a small increase in the marriages of Congregationalists, Quakers and Mennonites is shown.

## MONTHS.

*(See Table 10).*

October and December have in previous years been the favourite months for marrying, and in 1886 December still ranked the highest, but March returned as many marriages as October, which was quite exceptional, as during the last six years March

never ranked higher than fifth, generally sixth and seventh in the numerical order of months. The month of August ranked the lowest in the number of marriages the same as in former years.

The difference between the month returning the largest number of marriages and the one returning the lowest number was 902, or 52 per cent. less.

#### AGES.

(See Table 11).

The proportion between the sexes as regards their ages when married, was largely in favour of the females in the periods under 20 years of age and between 20 and 25. The table shows that 9,160 females were married in those two periods of life, and only 5,017 males, being 82 per cent. more females than males, but in the succeeding periods the proportion was altogether in favour of the males.

The following abstract shows the percentage of each sex to the whole number married in the different periods of life :

Males under 20 years when married				1.1	per cent.				Females	17.3	per cent.	
"	between	20	and 25	"	35.3	"	"	"	"	48.9	"	"
"	"	25	" 30	"	36.5	"	"	"	"	22.0	"	"
"	"	30	" 35	"	13.2	"	"	"	"	5.5	"	"
"	"	35	" 40	"	5.8	"	"	"	"	2.8	"	"
"	"	40	" 45	"	3.0	"	"	"	"	1.5	"	"
"	"	45	" 50	"	1.7	"	"	"	"	.7	"	"
"	"	50	" 55	"	1.2	"	"	"	"	.4	"	"
"	"	55	" 60	"	.7	"	"	"	"	.1	"	"
"	"	60	" 65	"	.7	"	"	"	"	.2	"	"
"	"	65	" 70	"	.3	"	"	"	"	.103	"	"
"	"	70	" 75	"	.1	"	"	"	"	.035	"	"
"	"	75	" 80	"	.07	"	"	"	"	.001	"	"
"	"	80	and over	"	.02	"	"	"	"	.001	"	"
Ages not given				"	.31	"	"	"	"	.46	"	"
					100						100	

#### MARRIAGES AT ADVANCED AGES.

(See Table 12).

There were 31 marriages recorded, in which either the bridegroom or bride was 70 years of age or over. Two of the bridegrooms were each 82 years old when married, and in one marriage the bride and bridegroom were each 80 years of age. Their united ages, 160 years, was greater than the total ages of any couple married in Ontario as far as the returns show.

#### YOUTHFUL MARRIAGES.

As usual a number of instances of girls marrying at tender years appear in the return. Five were married at 14 years, and 28 at 15 years. The boys do not appear to have been in such haste to marry, as the returns show that none engaged in matrimony under 18 years of age.



TABLE 1.

TABLE showing the total number of Births, Marriages and Deaths in each County in 1885 and 1886.

COUNTIES.	Population.	BIRTHS.			MARRIAGES.			DEATHS.			TOTALS.			RATIO TO 1,000 OF THE POPULATION.		
		Number in 1885.	Number in 1886.	Increase.	Decrease.	Number in 1885.	Number in 1886.	Increase.	Decrease.	Number in 1885.	Number in 1886.	Increase.	Decrease.	Births.	Marriages.	Deaths.
Algoma .....	22550	542	576	34	.....	297	142	.....	95	285	234	.....	51	1064	952	25.7
Brant .....	37239	782	792	10	.....	298	245	.....	.....	426	428	2	.....	1446	1465	21.5
Carleton .....	71344	1379	1410	31	.....	356	353	.....	3	489	509	20	.....	2224	2272	19.8
Carleton Place .....	70513	2452	2753	301	.....	545	606	61	.....	1256	1486	230	.....	4253	4815	39.0
Dufferin .....	22589	548	570	22	.....	137	176	39	.....	177	238	61	.....	802	984	25.2
Elgin .....	46597	846	870	24	.....	334	294	.....	40	371	373	2	.....	1551	1537	18.7
Essex .....	51218	1501	1502	1	.....	342	376	34	.....	654	760	106	.....	2497	2638	25.2
Frontenac .....	46812	887	775	.....	112	331	294	.....	37	539	556	.....	3	1777	1625	19.3
Grey .....	77582	1486	1450	.....	36	419	470	51	.....	543	581	38	.....	2448	2501	17.0
Haldimand .....	27491	477	550	73	.....	192	177	.....	15	236	225	.....	11	905	952	28.6
Halton .....	24112	461	473	12	.....	120	113	.....	7	238	243	5	.....	819	829	19.6
Haliburton .....	6511	173	173	.....	.....	.....	28	28	.....	43	43	.....	.....	244	244	10.0
Hastings .....	60712	1104	1265	161	.....	488	431	.....	57	626	497	.....	129	2218	1993	26.5
Huron .....	84179	1382	1557	.....	25	477	461	.....	16	611	581	.....	30	2670	2599	31.1
Kent .....	59769	1100	1038	.....	71	370	386	16	.....	531	526	.....	5	2010	1950	18.5
Laurelton .....	57238	1130	1245	115	.....	301	319	18	.....	479	518	39	.....	1910	2112	17.3
Leamark .....	37372	809	791	.....	18	267	270	3	.....	306	375	69	.....	1382	1436	21.7
Leeds and Grenville .....	66181	962	1047	85	.....	420	361	.....	59	701	654	.....	47	2083	2062	21.1
Lennox and Addington .....	29133	425	372	.....	53	186	212	26	.....	225	209	.....	16	836	793	15.8
Lincoln .....	34719	697	669	.....	28	206	194	.....	12	411	431	20	.....	1314	1294	19.2
Middlesex .....	102389	1988	1798	.....	190	586	608	82	.....	1085	1041	.....	44	3659	3507	43.3
Muskoka and Parry Sound .....	29926	937	969	32	.....	136	225	29	.....	325	304	.....	21	1458	1498	15.2
Norfolk .....	36879	643	708	65	.....	236	206	.....	30	297	322	25	.....	1176	1236	17.5
Northumberland and Durham .....	85129	1417	1328	.....	89	470	516	46	.....	856	674	.....	182	2743	2518	32.4
Ontario .....	53693	1058	1112	84	.....	290	266	.....	24	502	473	.....	29	1850	1881	19.2
Oxford .....	55176	1111	1121	10	.....	310	360	50	.....	472	519	47	.....	1893	2000	25.6
Peel .....	28793	519	568	49	.....	131	137	.....	14	255	296	41	.....	925	1031	20.3
Perth .....	59055	1128	1138	10	.....	352	359	7	.....	440	537	97	.....	1900	2014	30.0



TABLE 1.—Continued.

COUNTIES.	BIRTHS.				MARRIAGES.				DEATHS.				TOTALS.				RATIO TO 1,000 OF THE POPULATION.					
	Number in 1885.		Number in 1886.		Number in 1885.		Number in 1886.		Number in 1885.		Number in 1886.		Increase.		Decrease.							
	Births.	Deaths.	Increase.	Decrease.	Births.	Deaths.	Increase.	Decrease.	Births.	Deaths.	Increase.	Decrease.	Births.	Deaths.	Increase.	Decrease.						
Peterborough .....	859	787	.....	72	272	241	.....	31	381	321	.....	60	1512	1349	.....	163	23.6	7.2	9.6			
Prescott and Russell .....	1377	1410	33	.....	250	238	.....	12	636	668	32	.....	2263	2316	53	.....	23.7	5.6	15.1			
Prince Edward .....	23149	361	357	4	142	125	.....	17	271	282	11	.....	774	764	.....	10	15.4	5.4	12.1			
Renfrew .....	44271	1204	1246	42	316	264	.....	52	373	423	50	.....	1893	1933	40	.....	28.1	5.9	9.5			
Sincoe .....	82394	1639	1687	48	481	517	36	.....	601	587	14	.....	2721	2791	70	.....	20.4	6.2	7.1			
Stormont, Dundas and Glengarry .....	72618	1139	1143	4	382	378	.....	4	610	589	21	.....	2131	2110	.....	21	15.7	5.2	8.1			
Victoria .....	37021	792	826	34	194	194	.....	.....	296	296	.....	.....	1282	1316	34	.....	22.3	5.2	8.0			
Waterloo .....	47008	1242	1337	95	331	381	50	.....	489	536	67	.....	2042	2254	212	.....	28.4	8.1	11.4			
Welland .....	34948	719	731	12	213	197	.....	16	377	307	.....	70	1309	1285	.....	74	20.8	5.6	8.7			
Wellington .....	72808	1357	1348	.....	9	408	391	.....	17	643	702	57	.....	2410	2441	31	.....	18.5	5.3	9.6		
Wentworth .....	73649	1807	1891	84	609	551	.....	58	1091	1224	127	.....	3313	3666	153	.....	25.6	7.4	16.6			
York .....	168408	4752	5045	293	1540	1743	-203	.....	2993	3586	593	.....	9285	10374	1089	.....	30.0	10.3	21.3			
Totals .....	2115971	45228	46458	1937	707	13675	13845	786	616	22105	23184	1812	733	81008	83487	3642	1163	22.0	6.5	11.0		
				Increase, 1230.				Increase, 170.				Increase, 1079.				Total increase in B., M. and D., 2479.						

Returns from Haliburton in 1885 included in Victoria and Peterborough.

TABLE 2.

BURNS, MARRIAGES AND DEATHS IN THE CITIES IN 1885 AND 1886.

CITIES.	Population as returned by Assessors.	BIRTHS.				MARRIAGES.				DEATHS.				TOTALS.				RATIO TO 1,000 OF THE POPULATION.			
		Increase.		Decrease.		Increase.		Decrease.		Increase.		Decrease.		Increase.		Decrease.		Births.	Marriages.	Deaths.	
		Number in 1885.	Number in 1886.	Number in 1885.	Number in 1886.	Number in 1885.	Number in 1886.	Number in 1885.	Number in 1886.	Number in 1885.	Number in 1886.	Number in 1885.	Number in 1886.	Number in 1885.	Number in 1886.	Number in 1885.	Number in 1886.				
Toronto.....	118403	3324	3462	138	.....	1216	1364	148	.....	2393	2850	457	....	6933	7676	743	....	29.2	11.5	24.2	
Hamilton .....	41712	1080	1128	48	.....	453	389	.....	64	684	768	84	....	2217	2285	68	....	27.0	9.3	18.4	
Ottawa .....	34857	1481	1725	244	.....	375	427	52	.....	927	1100	173	....	2783	3252	469	....	50.0	12.2	31.5	
London .....	26047	497	524	27	.....	232	315	83	.....	386	389	3	....	1115	1228	113	....	20.0	12.1	14.9	
Kingston.....	15827	350	269	.....	81	163	176	13	.....	272	282	10	....	785	727	....	58	17.0	11.1	17.7	
Brantford .....	12570	312	315	3	.....	110	126	16	.....	175	193	18	....	597	634	37	....	25.6	10.0	15.3	
St. Thomas.....	10127	254	270	16	.....	154	143	.....	11	115	137	22	....	523	550	27	....	26.6	14.1	13.5	
Guelph.....	10216	258	250	.....	8	96	107	11	.....	159	182	23	....	513	539	26	....	24.4	10.4	17.8	
St. Catharines .....	9779	180	182	2	.....	95	81	.....	14	156	172	16	....	431	435	4	....	18.6	8.2	17.6	
Belleville .....	10076	209	203	....	6	116	107	.....	9	184	150	....	34	509	460	....	49	20.1	10.6	14.8	
Stratford .....	9069	200	200	.....	.....	68	65	.....	3	89	125	36	....	357	390	33	....	22.0	7.1	13.7	
	298683	8145	8528	473	95	3078	3300	323	101	5540	6348	842	34	16763	18176	1520	107	27.1	11.4	21.2	
		Increase, 833.				Increase, 222.				Increase, 808.				Total increase in B., M. and D., 1413.							

TABLE 3

Births, Marriages and Deaths, in the Towns in 1885 and 1886.

TOWNS.	Population as returned by Assessors.	BIRTHS.			MARRIAGES.			DEATHS.			TOTALS.			RATIO TO 1,000 OF THE POPULATION.			
		Number in 1885.	Number in 1886.	Increase. Decrease.	Number in 1885.	Increase. Decrease.	Number in 1886.	Increase. Decrease.	Number in 1885.	Increase. Decrease.	Number in 1886.	Increase. Decrease.	Births.	Marriages.	Deaths.		
Kincardine .....	2886	52	67	15	15	6	21	6	37	43	104	131	27	23.2	7.2	15.0	
Windsor .....	7336	182	217	35	69	22	91	22	102	130	353	438	85	29.5	12.4	17.7	
Owen Sound .....	5672	150	141	9	65	9	57	8	55	47	270	285	15	24.8	10.0	15.3	
Goderich .....	3927	63	72	9	44	13	31	13	45	32	132	133	1	18.3	7.9	10.1	
Chatham .....	8457	134	147	13	132	10	122	10	113	119	379	388	9	17.3	14.4	14.0	
Chatham .....	8457	134	147	13	132	10	122	10	113	119	379	388	9	17.3	14.4	14.0	
Samia .....	5288	112	140	28	49	7	56	7	46	60	207	256	49	26.4	10.7	11.3	
Perth .....	3930	112	99	13	57	5	62	5	62	81	231	242	11	25.2	15.7	20.6	
Perth .....	3930	112	99	13	57	5	62	5	62	81	231	242	11	25.2	15.7	20.6	
Napanee .....	3414	72	65	7	62	61	9	1	56	50	190	176	14	19.0	17.8	14.6	
Napanee .....	3414	72	65	7	62	61	9	1	56	50	190	176	14	19.0	17.8	14.6	
Brookville .....	8320	182	139	43	97	50	52	47	143	149	422	338	84	16.7	6.0	17.9	
Brookville .....	8320	182	139	43	97	50	52	47	143	149	422	338	84	16.7	6.0	17.9	
Cobourg .....	4940	100	64	36	49	3	52	3	38	39	187	155	32	13.0	10.5	8.0	
Port Hope .....	5514	102	92	10	47	10	57	10	51	46	200	195	5	16.6	10.3	8.4	
Whitby .....	3023	47	70	23	23	6	19	4	42	36	112	125	13	23.1	6.2	11.9	
Woodstock .....	6718	156	157	1	66	72	6	6	58	60	280	289	9	23.3	10.7	9.0	
Woodstock .....	6718	156	157	1	66	72	6	6	58	60	280	289	9	23.3	10.7	9.0	
Brampton .....	3313	77	74	3	49	35	14	14	66	76	192	185	7	22.3	10.5	22.9	
Brampton .....	3313	77	74	3	49	35	14	14	66	76	192	185	7	22.3	10.5	22.9	
Peterborough .....	8149	160	192	32	115	113	113	2	102	121	377	426	49	19.6	13.8	14.8	
Peterborough .....	8149	160	192	32	115	113	113	2	102	121	377	426	49	19.6	13.8	14.8	
Cornwall .....	5710	112	98	14	68	72	72	4	79	74	359	344	15	17.1	12.6	12.9	
Pictou .....	2825	52	52	0	56	38	38	18	57	50	165	140	5	18.4	13.4	17.7	
Barrie .....	4412	89	114	25	82	72	72	2	59	57	230	243	13	25.8	16.3	12.9	
Pembroke .....	3666	137	142	5	76	37	37	39	46	83	259	262	3	38.7	10.0	22.6	
Lindsay .....	5512	99	108	9	57	61	61	4	72	59	228	228	13	19.5	11.0	10.7	
Lindsay .....	5512	99	108	9	57	61	61	4	72	59	228	228	13	19.5	11.0	10.7	
Berlin .....	5343	172	153	19	32	68	68	36	53	72	237	233	36	28.6	12.7	13.4	
Berlin .....	5343	172	153	19	32	68	68	36	53	72	237	233	36	28.6	12.7	13.4	
Galt .....	6322	187	188	1	54	59	59	5	83	93	324	340	16	29.5	9.3	14.7	
Orangeville .....	3100	69	52	17	48	49	49	1	36	69	153	170	17	16.7	15.8	22.2	
Paris .....	3311	95	108	13	30	21	21	9	48	47	173	176	3	32.6	6.3	14.1	
Total .....	121088	2713	2751	209	171	109	1376	175	1549	1741	5704	5868	355	22.7	11.3	14.3	
												Total increase in B., M. and D. 164.					
												Increase, 192.					
												Decrease, 66.					
												Increase, 38.					

TABLE 4.

Births by Months in the Province, 1886, shewing the proportion of Male to Female Births in the Province, and also in the Cities.

SEX.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Males.....	2092	1888	2243	2102	2030	1878	1993	2095	2033	1943	1800	1974	24071
Females .....	1831	1848	2049	1932	1837	1839	1843	1964	1930	1835	1717	1762	22387
Total .....	3923	3736	4292	4034	3867	3717	3836	4059	3963	3778	3517	3736	46458
Male births to 100 female births.....	114.2	102.1	109.4	108.8	110.5	102.1	108.1	106.6	105.3	105.8	104.8	112.0	107.5

## CITIES.

SEX.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Males.....	333	331	406	360	357	346	428	392	409	352	340	382	4436
Females .....	315	302	368	321	346	338	348	391	318	347	343	355	4092
Total ...	648	633	774	681	703	684	776	783	727	699	683	737	8528
Male Births to 100 female births.....	105.7	109.6	110.3	112.1	103.1	102.3	123.0	100.3	128.6	104.4	99.1	107.6	108.4

TABLE 5.

Order of Births, by Months, in 1885 and 1886.

MONTHS.	1885.			MONTHS.	1886.		
	Male.	Female.	Total.		Male.	Female.	Total.
March .....	2090	1976	4066	March .....	2243	2049	4292
May .....	2067	1920	3987	August .....	2095	1964	4059
September .....	2021	1916	3937	April .....	2102	1932	4034
April .....	2027	1858	3885	September .....	2033	1930	3963
August .....	2023	1835	3858	January .....	2092	1831	3923
February .....	1913	1878	3791	May .....	2030	1837	3867
July .....	1952	1803	3755	July .....	1993	1843	3836
October .....	1914	1796	3710	October .....	1943	1835	3778
January .....	1989	1716	3705	February .....	1888	1848	3736
December .....	1888	1744	3632	December .....	1974	1762	3736
June .....	1898	1591	3489	June .....	1878	1839	3717
November .....	1805	1608	3413	November .....	1800	1717	3517
Total .....	23587	21641	45228	Total .....	24071	22387	46458

TABLE 6.

Quarterly Return of Births in 1885 and 1886.

QUARTERS.	1885.			1886.		
	Male.	Female.	Total.	Male.	Female.	Total.
Quarter ending March 31st .....	5992	5570	11562	6223	5728	11951
“ June 30th .....	5992	5369	11361	6010	5608	11618
“ September 30th .....	5996	5554	11550	6121	5737	11858
“ December 31st .....	5607	5148	10755	5717	5314	11031
Total .....	23587	21641	45228	24071	22387	46458

TABLE 7.

The number of births within the several specified periods was as follows :—

For the year .....	46,458—	Males, 24,071 ;	Females, 22,387
“ month .....	3,871	“	2,006
“ week .....	893	“	463
“ day .....	127	“	66

The difference between the male and female births reported in each year, for the last ten years, is shown to have been as follows :—

In 1877 there were 1,361 more male than female births.

“ 1878	“	1,780	“	“	“
“ 1879	“	1,651	“	“	“
“ 1880	“	1,726	“	“	“
“ 1881	“	1,580	“	“	“
“ 1882	“	1,373	“	“	“
“ 1883	“	1,249	“	“	“
“ 1884	“	1,484	“	“	“
“ 1885	“	1,946	“	“	“
“ 1886	“	1,684	“	“	“



TABLE 8.  
ILLEGITIMATE BIRTHS, TWINS AND TRIPLETS

YEAR.	ILLEGITIMATE BIRTHS.			No. of Pairs of Twins.	No. of cases of Triplets.
	No.	Proportion to the whole Number of Births.	Ratio in every 1,000 Births.		
1872.....	235	One in every 99 Births .....	10.0	76	0
1873 .....	229	“ “ 129 “ .....	8.3	200	1
1874.....	196	“ “ 144 “ .....	6.9	255	2
1875.....	198	“ “ 131 “ .....	4.8	264	1
1876 .....	392	“ “ 98 “ .....	10.1	349	1
1877.....	529	“ “ 75 “ .....	13.2	411	5
1878.....	575	“ “ 70 “ .....	14.2	425	9
1879.....	524	“ “ 78 “ .....	12.7	378	1
1880.....	671	“ “ 63 “ .....	15.8	407	6
1881.....	748	“ “ 54 “ .....	18.3	384	3
1882.....	966	“ “ 43 “ .....	22.7	389	5
1883.....	989	“ “ 43 “ .....	23.0	377	8
1884.....	644	“ “ 69 “ .....	14.4	382	8
1885.....	621	“ “ 72 “ .....	13.7	238	7
1886.....	671	“ “ 69 “ .....	14.4	375	3
Average for 15 years....	546	One in every 82 Births. ... ..	.....	317	4



TABLE 9.  
Marriages by Denominations, with Percentage and Proportion to the Whole.

DENOMINATIONS.	1881.				1882.				1883.			
	Number of persons Married.	Per cent. of the whole.	PROPORTION TO THE WHOLE NUMBER OF PERSONS MARRIED.		Number of persons Married.	Per cent. of the whole.	PROPORTION TO THE WHOLE NUMBER OF PERSONS MARRIED.		Number of persons Married.	Per cent. of the whole.	PROPORTION TO THE WHOLE NUMBER OF PERSONS MARRIED.	
Methodists .....	9147	35.29	1	in every 2.83	9496	35.66	1	in every 2.80	9907	35.04	1	in every 2.85
Presbyterians .....	5202	20.07	1	" 4.98	5469	20.59	1	" 4.87	5635	19.94	1	" 5.01
Episcopalians .....	4593	17.72	1	" 5.64	4673	17.54	1	" 5.69	5067	17.93	1	" 5.58
Roman Catholics ..	3526	13.60	1	" 7.35	3602	13.52	1	" 7.39	4106	14.53	1	" 6.89
Baptists .....	1519	5.85	1	" 17.06	1462	5.48	1	" 18.21	1454	5.14	1	" 19.50
Lutherans .....	578	2.23	1	" 44.85	506	1.89	1	" 52.63	561	1.98	1	" 50.37
Congregationalists .....	233	.90	1	" 111.26	237	.88	1	" 112.38	304	1.08	1	" 92.90
Evangelical Association .....					137	.58	1	" 169.64	174	.61	1	" 160.42
Mennonites .....	152	.58	1	" 170.55	145	.54	1	" 183.69	145	.52	1	" 194.22
Bible Christians .....	561	2.17	1	" 46.21	520	1.93	1	" 51.22	559	1.98	1	" 50.55
Quakers .....	15	.05	1	" 1728.33	9	.05	1	" 2959.33	27	.10	1	" 1046.74
Other Denominations .....	399	1.54	1*	" 64.97	359	1.34	1	" 74.19	323	1.15	1	" 87.50
Total .....	25925	100.00			26635	100.00			28262	100.00		

TABLE 9.—Continued.  
Marriage by Denominations, with Percentage and Proportion to the Whole.

DENOMINATIONS.	1884.			1885.			1886.		
	Number of persons Married.	Per cent. of the whole.	PROPORTION TO THE WHOLE NUMBER OF PERSONS MARRIED.	Number of persons Married.	Per cent. of the whole.	PROPORTION TO THE WHOLE NUMBER OF PERSONS MARRIED.	Number of persons Married.	Per cent. of the whole.	PROPORTION TO THE WHOLE NUMBER OF PERSONS MARRIED.
Methodists .....	10211	37.80	1 in every 2.64	10054	37.02	1 in every 2.70	11005	39.92	1 in every 2.50
Presbyterians .....	5496	20.41	1 " 4.92	5367	19.38	1 " 5.15	5788	21.00	1 " 4.72
Episcopalians .....	4637	17.22	1 " 5.82	4657	17.15	1 " 5.83	4389	15.92	1 " 6.28
Roman Catholics .....	3890	14.40	1 " 6.94	4132	15.21	1 " 6.57	3843	13.95	1 " 7.17
Baptists .....	1291	4.74	1 " 20.92	1482	5.45	1 " 18.32	1250	4.54	1 " 22.04
Lutherans .....	504	1.84	1 " 53.59	534	1.96	1 " 50.86	480	1.74	1 " 57.41
Congregationalists .....	294	1.08	1 " 91.87	237	.87	1 " 114.64	269	.97	1 " 102.45
Evangelical Association ..	170	.62	1 " 158.82	181	.66	1 " 150.77	145	.53	1 " 190.11
Mennonites .....	148	.54	1 " 182.50	138	.57	1 " 196.81	141	.52	1 " 195.46
Quakers .....	13	.04	1 " 2077.68	11	.04	1 " 2409.45	17	.06	1 " 1621.18
Other Denominations .....	356	1.31	1 " 75.87	461	1.69	1 " 58.92	233	.85	1 " 118.28
Total .....	27010	100.00		27154	100.00		27560	100.00	

Those marriages in which the denomination of the parties married were not given are omitted in this Table.

TABLE 10.  
Marriages by Months, in numerical order, for Six Years.

1881.		1882.		1883.		1884.		1885.		1886.	
December .....	1593	December .....	1573	December .....	1614	December .....	1543	December .....	1736	December .....	1717
October .....	1314	October .....	1340	October .....	1547	October .....	1437	October .....	1330	October .....	1342
November .....	1250	November .....	1330	January .....	1519	January .....	1271	September .....	1297	March .....	1342
September .....	1180	January .....	1232	November .....	1263	November .....	1256	November .....	1252	November .....	1305
March .....	1169	September .....	1202	March .....	1167	September .....	1147	January .....	1246	September .....	1286
January .....	1165	March .....	1164	September .....	1139	February .....	1124	March .....	1114	June .....	1188
February .....	1023	February .....	1158	April .....	1130	April .....	1109	February .....	1105	January .....	1118
June .....	1010	April .....	1004	February .....	1044	March .....	1090	June .....	1065	February .....	1068
April .....	918	May .....	921	June .....	1018	June .....	1066	April .....	1043	May .....	903
May .....	902	June .....	880	May .....	1014	July .....	961	July .....	941	April .....	894
August .....	801	July .....	834	July .....	942	May .....	855	May .....	768	July .....	880
July .....	724	August .....	753	August .....	821	August .....	735	August .....	746	August .....	815
No date given .....		No date given ..	58	No date given ..	59	No date given ..	52	No date given ..	32	No date given ..	37
Total .....	13049	Total .....	13449	Total ....	14277	Total .....	13646	Total .....	13675	Total .....	13845

The average number of Marriages per quarter was  
" " " month ..... 3,461  
" " " week ..... 1,154  
" " " day ..... 266  
" " " " ..... 38

TABLE 11.

## Marriages by Ages for Six Years.

QUINQUENNIAL PERIODS OF LIFE.	1881.		1882.		1883.		1884.		1885.		1886.		Total No. of Marriages, 81,998.			
	Whole No. of Marriages, 13,106		Whole No. of Marriages, 13,449		Whole No. of Marriages, 14,277		Whole No. of Marriages, 13,616		Whole No. of Marriages, 13,675		Whole No. of Marriages, 13,845		Males.	Per cent. of whole.	Females.	Per cent. of whole.
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.				
Under 20 years ... ..	162	2793	175	2808	175	2841	141	2637	144	2542	148	2399	945	1.15	16040.19.56	
From 20 to 25 years .....	4859	6578	5072	6659	5341	7168	5125	6849	5007	6781	4869	6761	30273	36.91	40796.50.00	
" 25 to 30 " .....	4493	2272	4758	2516	4944	2599	1784	2580	4862	2765	5065	3030	28906	35.25	15762.19.22	
" 30 to 35 " .....	1738	652	1657	681	1869	771	1740	710	1752	1746	1832	766	10588	12.91	4326.5.27	
" 35 to 40 " .....	767	312	733	303	734	337	724	320	788	354	811	390	4557	5.55	2016.2.45	
" 40 to 45 " .....	374	186	381	174	429	212	381	189	410	178	408	199	2383	2.90	1138.1.38	
" 45 to 50 " .....	241	108	207	95	240	117	217	109	229	106	234	105	1398	1.70	641.78	
" 50 to 55 " .....	155	72	149	72	177	58	162	48	119	58	163	57	955	1.16	365.44	
" 55 to 60 " ..	115	38	107	35	116	60	104	36	114	40	99	28	655	.80	237.29	
" 60 to 65 " .....	74	29	77	22	87	22	65	23	70	19	97	30	471	.57	145.17	
" 65 to 70 " .....	40	12	44	6	61	8	38	9	45	4	41	12	269	.32	51.05	
" 70 to 75 " .....	31	5	26	7	31	5	22	4	13	2	15	4	139	.17	27.03	
" 75 to 80 " .....	18	1	11	2	9	1	6	.....	8	.....	10	1	62	.07	5.006	
" 80 and over .....	2	.....	2	.....	.....	.....	6	.....	1	.....	3	1	14	.01	1.001	
Ages not given .....	37	48	50	68	64	78	100	112	82	80	50	62	383	.46	448.54	
Total. ....	13106	13106	13449	13449	14277	14277	13616	13646	13675	13675	13845	13845	81998	.....	81998. ....	

TABLE 12.

MARRIAGES exhibiting great disparity of age between Bridegroom and Bride in 1886.

COUNTIES.	BRIDEGROOM THE ELDER.			COUNTIES.	BRIDEGROOM THE ELDER.			COUNTIES.	BRIDE THE ELDER.		
	Occupation of Bridegroom.	Age of Bridegroom.	Age of Bride.		Occupation of Bridegroom.	Age of Bridegroom.	Age of Bride.		Occupation of Bridegroom.	Age of Bridegroom.	Age of Bride.
Brant .....	Farmer .....	71	50	Middlesex .....	Farmer .....	74	60	Brant .....	Laborer .....	56	72
" .....	" .....	71	65	Norfolk .....	" .....	70	60	Bruce .....	Farmer .....	69	70
Carleton .....	" .....	70	45	" .....	" .....	82	73	Norfolk .....	Gentleman .....	72	76
Essex .....	" .....	77	60	Oxford .....	" .....	82	53	Wellington .....	Laborer .....	58	70
Haldimand .....	" .....	70	55	" .....	" .....	80	80				
Hastings .....	Gentleman .....	72	44	" .....	" .....	72	53				
Huron .....	Farmer .....	72	54	Perth .....	" .....	70	69				
Kent .....	Laborer .....	72	67	Prince Edward .....	Gentleman .....	75	58				
Lambton .....	Chemist .....	75	55	Waterloo .....	Farmer .....	75	53				
Leeds and Grenville ..	Farmer .....	71	65	Wentworth .....	" .....	75	60				
Lennox and Addington	" .....	75	46	York .....	Blacksmith .....	78	67				
" .....	" .....	71	66	" .....	Major, British Army	78	35				
Lincoln .....	Coach-builder ..	76	33	" .....	Not stated .....	76	50				
" .....	Shoe-maker .....	71	51								

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## DEATHS.

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TABLE 13.—Shewing the Death Rate per 1000 of population, in each County of the Province, for six years : also average for that time.

COUNTIES.	1881.	1882.	1883.	1884.	1885.	1886.	Ave six yrs.
Algoma.....	5.9	6.7	6.7	9.5	14.02	10.4	8.8
Brant.....	12.9	10.4	11.3	11.4	12.5	11.5	11.6
Bruce.....	8.5	8.1	7.4	7.3	7.5	7.1	7.6
Carleton.....	17.9	23.6	23.0	19.8	19.5	21.7	20.9
Dufferin.....	8.4	9.1	8.4	9.1	8.6	10.5	9.0
Elgin.....	9.3	7.5	7.7	8.2	8.7	8.0	8.2
Essex.....	18.8	14.5	12.6	14.4	14.04	14.8	14.8
Frontenac.....	14.2	14.8	15.8	12.9	13.1	12.0	13.8
Grey.....	6.9	8.3	6.4	7.0	7.6	7.4	7.3
Haldimand.....	12.4	9.2	7.5	8.7	9.4	8.2	9.2
Halton.....	12.5	11.7	9.4	10.9	10.8	10.0	10.9
Hastings.....	11.5	10.6	10.4	13.0	11.3	8.1	10.8
Huron.....	10.0	8.9	8.2	8.0	7.9	7.0	8.3
Kent.....	10.6	10.0	9.2	9.9	9.7	8.8	9.7
Lambton.....	10.4	8.2	8.1	10.4	9.2	9.5	9.3
Lanark.....	8.1	7.2	7.5	9.4	9.0	10.0	8.3
Leeds and Grenville.....	11.4	10.7	9.4	9.1	11.6	10.0	10.3
Lennox and Addington.....	10.7	10.0	9.8	8.7	8.5	7.1	9.1
Lincoln.....	14.3	12.6	12.7	13.8	13.02	12.4	13.1
Middlesex.....	16.2	11.8	10.4	12.2	11.6	10.1	12.1
Mus-koka and Parry Sound.....	8.5	10.5	9.4	8.6	11.9	10.1	9.8
Norfolk.....	11.7	10.2	8.8	9.2	8.8	8.9	9.6
Northumberland and Durham.....	9.7	9.0	8.9	9.5	11.06	7.9	9.3
Ontario.....	11.9	10.2	11.8	11.1	10.2	8.8	10.6
Oxford.....	11.3	12.0	11.2	10.3	9.4	9.4	10.6
Peel.....	10.7	12.8	10.0	11.5	9.7	10.3	10.8
Perth.....	10.5	9.5	8.2	7.7	8.1	9.1	9.0
Peterboro'.....	11.4	10.4	11.8	10.9	10.9	9.6	10.8
Prescott and Russell.....	9.9	11.4	10.2	11.1	16.7	15.1	12.4
Prince Edward.....	12.3	16.5	11.9	13.7	12.8	12.1	13.2
Renfrew.....	8.4	8.1	7.9	8.3	9.2	9.5	8.5
Simcoe.....	8.3	8.3	8.1	8.5	8.02	7.1	8.0
Stormont, Dundas and Glengarry.....	9.5	8.2	7.2	8.8	9.2	8.1	8.5
Victoria.....	8.9	9.5	10.3	10.4	8.4	8.0	9.3
Waterloo.....	13.9	13.5	11.5	10.9	10.9	11.4	12.0
Welland.....	12.8	12.1	10.0	10.4	11.8	8.7	10.9
Wellington.....	12.0	10.9	10.8	10.8	9.7	9.6	10.6
Wentworth.....	17.1	15.9	18.1	17.0	16.3	16.6	16.8
York.....	16.4	16.1	17.8	18.1	19.5	21.3	18.2
Total.....	11.8	11.3	10.9	11.2	11.4	11.0	11.2

Death rate to 1,000 of population, during the last six years in the eleven Cities.

CITIES.	1881.	1882.	1883.	1884.	1885.	1886.	Average for the six yrs.
Toronto.....	19.5	20.0	21.3	20.4	21.4	24.2	21.1
Hamilton.....	18.0	17.7	20.9	18.4	17.1	18.4	18.4
Ottawa.....	30.7	44.9	39.4	34.0	28.3	33.4	35.1
London.....	18.9	16.0	13.3	15.8	14.7	14.9	15.6
Kingston.....	20.0	22.2	25.1	17.5	18.0	17.7	20.1
Brantford.....	18.4	16.2	13.5	12.0	14.3	15.3	14.9
St. Thomas.....	11.8	9.8	8.4	8.4	10.3	13.5	10.4
Guelph.....	18.5	17.0	14.7	17.1	15.6	17.8	16.8
St. Catharines.....	20.2	16.2	16.5	19.0	15.7	17.6	17.5
Belleville.....	17.7	18.0	16.8	20.0	18.0	14.8	17.5
Stratford.....	12.7	8.6	6.8	9.2	10.1	13.7	10.1
Total.....	19.9	21.3	20.2	19.7	19.2	21.4	20.2

TABLE 14.

## Quarterly Return of Deaths in 1886 for the Province.

QUARTERS.	Males.	Females.	Total.	Per cent. of the whole.
Quarter ending March 31st.....	3114	3110	6224	26.9
“ “ June 30th.....	2884	2606	5490	23.7
“ “ September 30th .....	3097	2810	5907	25.4
“ “ December 31st .....	2827	2736	5563	24.0
Totals .....	11922	11262	23184	100.0

## Monthly Return of Deaths, arranged according to numbers.

MONTHS.	Males.	MONTHS.	Females.	TOTALS.		Per cent. of the whole.
				Months.	No.	
March .....	1131	March .....	1109	March .....	2240	9.7
September.....	1127	April .....	1033	September.....	2122	9.2
April .....	1064	February.....	1032	April .....	2097	9.0
August.....	1038	September .....	995	August.....	2001	8.7
January.....	1022	January.....	969	February.....	1993	8.6
October .....	963	August.....	963	January.....	1991	8.6
February.....	961	October .....	952	October .....	1915	8.2
May .....	961	December .....	910	December .....	1866	8.1
December .....	956	November.....	874	May .....	1803	7.8
July .....	932	July .....	852	July .....	1784	7.6
November....	908	May .....	842	November.....	1782	7.6
June .....	859	June .....	731	June.....	1590	6.9
	11922		11262		23184	100.0

TABLE 15.

Quarterly Return of Deaths in 1886 for the Cities.

QUARTERS.	Males.	Females.	Total.	Per Cent. of the Whole.
Quarter ending March 31st .....	827	820	1647	26.0
“ June 30th .....	859	735	1594	25.1
“ September 30th.....	924	787	1711	26.9
“ December 31st.....	724	672	1396	22.0
Totals.....	3334	3014	6348	100.0

Monthly Return of Deaths, arranged according to numbers.

MONTHS.	Males.	MONTHS.	Females.	TOTALS.	
				Months.	No.
September.....	319	February.....	291	April .....	599
April .....	311	April .....	288	July .....	574
July .....	307	August .....	275	August.....	573
May.....	305	July .....	267	September.....	564
August.....	298	January.....	265	May.....	553
March.....	288	March .....	264	March.....	552
January.....	284	May .....	248	January.....	549
December .....	265	September .....	245	February.....	546
February.....	255	December .....	231	December .....	496
June.....	243	October .....	222	October .....	460
October .....	238	November.....	219	June .....	442
November. ....	221	June.....	199	November.....	440
	3334		3014		6348

TABLE 16.

Deaths at different ages with percentage for six years from 1881 to 1886.

	1881.		1882.		1883.		1884.		1885.		1886.		Total in six yrs.		Cities for 1886.	
	No. of deaths.	Per cent. of the whole.	No. of deaths.	Per cent. of the whole.	No. of deaths.	Per cent. of the whole.	No. of deaths.	Per cent. of the whole.	No. of deaths.	Per cent. of the whole.	No. of deaths.	Per cent. of the whole.	Total deaths.	Per cent. of the whole.	Total deaths.	Per cent. of the whole.
Total under 1 year .....	5246	22.9	4874	22.3	4882	23.2	5242	24.1	4885	21.9	5293	22.8	30392	22.92	2016	31.8
“ from 1 to 5 years .....	3120	13.7	2952	13.6	2215	10.5	2157	9.9	2299	10.5	2805	12.1	15548	11.8	990	15.5
Total under 5 years .....	8366	36.6	7826	35.9	7097	33.7	7399	34.0	7154	32.4	8098	34.9	45940	34.7	3006	47.3
Total from 5 to 10 years .....	1144	5.1	1150	5.2	825	3.9	806	3.7	951	4.3	1157	4.9	6033	4.5	320	5.1
“ 10 “ 20 “ .....	1499	6.5	1449	6.6	1377	6.5	1296	6.0	1336	6.0	1428	6.3	8885	6.4	311	5.0
“ 20 “ 30 “ .....	2027	8.9	1930	8.8	2105	10.0	2075	9.6	2203	9.9	2049	8.9	12389	9.4	476	7.5
“ 30 “ 40 “ .....	1451	6.3	1359	6.3	1519	7.2	1477	6.8	1605	7.3	1521	6.5	8932	6.7	387	6.1
“ 40 “ 50 “ .....	1302	5.7	1301	5.5	1249	5.9	1267	5.8	1375	6.2	1333	5.8	7727	5.8	355	5.6
“ 50 “ 60 “ .....	1278	5.6	1257	5.8	1283	6.1	1285	5.9	1358	6.1	1376	5.9	7837	5.9	352	5.5
“ 60 “ 70 “ .....	1549	6.8	1590	7.4	1557	7.4	1617	7.4	1701	7.7	1693	7.2	9707	7.4	344	5.4
“ 70 “ 80 “ .....	2059	9.1	1952	8.9	1903	9.1	2251	10.4	2176	9.8	2163	9.3	12503	9.3	437	6.9
“ 80 “ 90 “ .....	1269	5.6	1250	5.8	1254	6.0	1307	6.3	1371	6.4	1486	6.4	7997	6.0	231	3.6
“ 90 “ 100 “ and over .....	265	1.1	273	1.2	223	1.1	206	1.4	287	1.3	261	1.2	1575	2.7	40	.6
Ages not given .....	613	2.7	563	2.6	657	3.1	596	2.7	588	2.6	619	2.7	3636	2.7	89	1.4
Total .....	22821	100.00	21800	100.00	21049	100.00	21702	100.00	22105	100.00	23184	100.00	132661	100.00	6348	100.00

TABLE 17.  
Nationalities of Decedents over Sixty Years of Age.

PERIODS.	English.	Irish.	Scotch.	Canadian.	American.	German.	French.	Swiss.	Other Countries.	Unknown.	Total.
Deaths between 60 and 70 years .....	390	467	238	450	54	63	7	2	8	14	1693
“ 70 “ 80 “ .....	452	661	368	400	125	71	9	5	19	53	2163
“ 80 “ 90 “ .....	287	477	283	254	92	51	8	3	4	27	1486
“ 90 “ 100 “ .....	69	87	59	36	41	14	2	6	3	20	337
“ 100 “ 110 “ .....	1	12	1	6	.....	.....	.....	.....	.....	.....	20
“ 110 “ 120 “ .....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1
“ 120 “ 130 “ .....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	3
Total Deaths over 60 years.....	1199	1705	949	1146	315	199	26	16	34	114	5703



TABLE 18.

List of Centenarians, 1886.

No.	Name.	Sex.	Occupation.	Where Born.	Age at Birth.	Cause of Death.	Where Died.
1	Andrew Lucas.....	M.	Labourer.....	United States.....	120	Paralysis.....	Brantford, City.
2	Lucy Thompson.....	F.	.....	".....	103	Old age.....	Amherstburgh, County of Essex.
3	Coleman Freeman.....	M.	Cooper.....	".....	121	".....	Windsor,
4	Catharine McAuley.....	F.	Farmer's wife.....	Ireland.....	100	Dropsy.....	Richmond,
5	Edward McCusker.....	M.	Farmer.....	".....	101	Old age.....	Lennox & Addington.
6	Mary Webb.....	F.	Widow.....	".....	110	".....	Sheffield,
7	Sarah Taylor.....	F.	".....	Virginia, U. S.....	120	Pneumonia.....	Prescott,
8	Matilda McKee.....	F.	Farmer's wife.....	Ireland.....	101	Old age.....	Leeds and Greenvile.
9	James Brown.....	M.	Farmer.....	".....	100	".....	Louth,
10	Sarah Coulter.....	F.	Farmer's wife.....	".....	104	".....	Lincoln.
11	Antoine Gofier.....	M.	Farmer.....	Wood Roy, Quebec.	103	".....	Dufferin.
12	Francois Lalonde.....	M.	Labourer.....	St. Augustine, "	100	".....	"
13	Jane Rowan.....	F.	Farmer's wife.....	Ireland.....	104	".....	Perth.
14	Thomas McMullen.....	M.	Farmer.....	".....	106	".....	Renfrew Village, County of Renfrew.
15	Nicholas Brennan.....	M.	".....	".....	100	".....	Cambridge, County of Prescott and Russell.
16	Isabella Heaslip.....	F.	".....	".....	105	".....	Erin, "
17	Julia Andrews.....	F.	Indian Woman.....	Ontario.....	100	".....	Arthur, "
18	James Watson.....	M.	Farmer.....	Ireland.....	100	".....	Nepean, "
19	Catharine Ross.....	F.	Widow.....	Scotland.....	106	".....	Cavan, "
20	Bridget Rogers.....	F.	Widow.....	Ireland.....	107	Gangrene.....	Alnwick, "
21	Mary Hurley.....	F.	Widow.....	".....	100	".....	Brighton, "
22	Jacobi Miller.....	M.	Farmer.....	".....	103	".....	Kinloss, "
23	William Corniel.....	M.	".....	".....	107	".....	Bruce.
24	Mary Walsh.....	F.	.....	".....	100	".....	York.

TABLE 19.

Ten Highest Causes of Death, with their percentage of the whole number of Deaths from specified causes, for the years 1877 to 1886, inclusive.

1877.			1878.			1879.			1880.		
Whole number of Deaths from specified causes ..... 19,260			Whole number of Deaths from specified causes .... 16,852			Whole number of Deaths from specified causes ..... 16,897			Whole number of Deaths from specified causes ..... 19,152		
DISEASES.	No. of Deaths.	Per cent. of the whole.	DISEASES.	Number of Deaths.	Per cent. of the whole.	DISEASES.	Number of Deaths.	Per cent. of the whole.	DISEASES.	Number of Deaths.	Per cent. of the whole.
Phthisis.....	2157	11.2	Phthisis.....	1999	11.8	Phthisis.....	2065	12.2	Phthisis.....	1254	11.2
Old Age .....	1661	8.6	Old Age.....	1722	10.2	Old Age .....	1749	10.3	Old Age .....	1658	8.6
Infantile Debility.....	1164	6.0	Infantile Debility.....	1100	6.5	Infantile Debility ....	955	5.6	Infantile Debility...	1300	6.7
Pneumonia.....	1060	5.4	Diphtheria .....	986	5.8	Pneumonia. ....	942	5.5	Pneumonia.....	1257	6.5
Diphtheria .....	964	5.0	Pneumonia. ....	836	4.9	Heart Disease .....	784	4.6	Diphtheria.....	822	4.2
Scarlet Fever.....	717	3.7	Heart Disease .....	621	3.6	Diphtheria .....	574	3.4	Heart Disease. ....	760	3.0
Heart Disease .....	697	3.6	Convulsions .....	454	2.1	Convulsions .....	445	2.6	Convulsions.....	518	2.7
Diarrhoea .....	666	3.4	Enteritis.....	417	2.4	Dropsy. ....	400	2.3	Bronchitis .....	438	2.3
Convulsions .....	573	2.9	Diarrhoea .....	401	2.3	Enteritis.....	393	2.3	Croup .....	429	2.2
Enteritis .....	497	2.5	Typhoid Fever .....	379	2.1	Diarrhoea .....	340	2.0	Congestion of Lungs.	419	2.1

TABLE 19—Continued.

1881.				1882.				1883.				1884.			
Whole number of Deaths from specified causes ..... 21,997				Whole number of Deaths from specified causes ..... 21,097				Whole number of Deaths from specified causes ..... 20,299				Whole number of deaths from specified causes ..... 21,149			
DISEASES.	Number of Deaths.		Per cent. of the whole.	DISEASES.	Number of Deaths.		Per cent. of the whole.	DISEASES.	Number of Deaths.		Per cent. of the whole.	DISEASES.	Number of Deaths.		Per cent. of the whole.
Phthisis .....	2397		10.8	Phthisis.....	2404		11.6	Phthisis.....	2500		12.3	Phthisis .....	2347		11.1
Old Age.....	1972		8.9	Anæmia.....	1895		8.9	Old Age.....	1731		8.5	Old Age .....	2065		9.7
Infantile Debility.....	1481		6.7	Old Age.....	1841		8.7	Anæmia.....	1600		7.8	Anæmia ...	1697		8.0
Diphtheria .....	1171		5.3	Pneumonia .....	1322		6.2	Pneumonia.....	1335		6.5	Pneumonia.....	1255		5.9
Pneumonia.....	1137		5.1	Diphtheria .....	1239		5.8	Heart Disease....	921		4.5	Heart Disease.....	929		4.3
Heart Disease .....	886		4.0	Heart Disease .....	753		3.5	Diphtheria .....	709		3.5	Diphtheria.....	698		3.1
Diarrhœa .....	818		3.7	Typhoid Fever .....	555		2.6	Convulsions .....	548		2.7	Paralysis .....	535		2.5
Typhoid Fever .....	616		2.8	Scarlatina.....	543		2.5	Bronchitis.....	497		2.4	Diarrhœa .....	531		2.5
Croup.....	533		2.4	Diarrhœa ...	497		2.3	Diarrhœa .....	471		2.3	Convulsions.....	527		2.4
Convulsions .....	509		2.3	Convulsions .....	492		2.3	Typhoid Fever .....	469		2.2	Enteritis.....	512		2.4

TABLE 19—Continued.

1885.			1886.		
Whole number of Deaths from specified causes..... 21,422			Whole number of Deaths from specified causes..... 22,371		
DISEASES.	Number of Deaths.	Per cent. of the whole.	DISEASES.	Number of Deaths.	Per cent. of the whole.
Phthisis ....	2313	10.8	Phthisis.....	2419	10.8
Old Age.....	2073	9.6	Old Age.....	2121	9.4
Anemia.....	1597	7.4	Anemia....	1664	7.4
Pneumonia.....	1348	6.3	Pneumonia.....	1507	6.7
Diphtheria.....	1006	4.7	Diphtheria.....	1406	6.2
Heart Disease .....	952	4.4	Heart Disease.....	1090	4.8
Convulsions .....	549	2.1	Convulsions.....	622	2.8
Paralysis.....	547	2.5	Diarrhoea .....	603	2.7
Bronchitis.....	501	2.3	Enteritis.....	516	2.3
Enteritis.....	485	2.2	Paralysis.....	507	1.3

TABLE 20.—Shewing the Population and Deaths in each County ; also

COUNTIES.	Estimated Population for 1886.	No. of Deaths.	Ratio to Population.	PHTHISIS.		OLD AGE.		ANÆMIA.	
				No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.
Algoma .....	22350	234	10.4	17	.7	10	.4	22	1.0
Brant .....	37239	428	11.5	44	1.1	40	1.0	14	.4
Bruce .....	71244	509	7.1	60	.8	54	.8	67	.9
Carleton .....	70513	1486	21.7	140	2.0	106	1.5	164	2.3
Dufferin .....	22589	238	10.5	13	.6	26	1.1	22	.9
Elgin .....	46597	373	8.0	39	.8	37	.8	31	.7
Essex .....	51218	760	14.8	77	1.1	42	.8	77	1.5
Frontenac .....	46812	556	12.0	60	1.2	64	1.3	35	.7
Grey .....	77582	581	7.4	43	.5	67	.8	39	.5
Haldimand .....	27491	225	8.2	18	.5	25	.9	10	.3
Halton .....	24112	243	10.0	24	1.0	13	.5	11	.4
Haliburton .....	6511	43	6.9					5	.7
Hastings .....	60712	497	8.1	62	1.2	56	.9	31	.5
Huron .....	84179	581	7.0	66	.8	60	.7	37	.4
Kent .....	59769	526	8.8	58	.9	43	.7	16	.2
Lambton .....	57238	548	9.5	49	.8	30	.5	38	.6
Lanark .....	37372	375	10.0	40	1.0	49	1.3	12	.3
Leeds and Grenville .....	66181	654	10.0	102	1.5	73	1.1	35	.5
Lennox and Addington .....	29133	209	7.1	35	1.2	24	.8	8	.2
Lincoln .....	34719	431	12.4	54	1.5	41	1.2	22	.6
Middlesex .....	102389	1041	10.1	109	1.0	96	.9	64	.6
Muskoka and Parry Sound .....	29926	304	10.1	21	.7	20	.6	33	1.1
Norfolk .....	36879	322	8.9	43	1.1	36	1.0	10	.3
Northumberland and Durham .....	85129	674	7.9	91	1.1	92	1.0	43	.5
Ontario .....	53693	473	8.8	51	.9	53	.9	25	.4
Oxford .....	55176	519	9.4	58	1.0	50	.9	36	.6
Peel .....	28793	296	10.3	31	1.0	43	1.5	19	.6
Perth .....	59055	537	9.1	50	.8	58	.9	31	.5
Peterborough .....	33270	321	9.6	29	.8	26	.8	18	.5
Prescott and Russell .....	41826	668	15.1	41	.9	45	1.0	140	3.3
Prince Edward .....	23149	282	12.1	41	1.7	37	1.6	14	.6
Renfrew .....	44271	423	9.5	41	.9	40	.8	38	.8
Simcoe .....	82394	587	7.1	58	.7	62	.7	46	.5
Stormont, Dundas and Glengarry .....	72618	589	8.1	83	1.1	81	1.1	44	.6
Victoria .....	37021	296	8.0	33	.8	25	.7	18	.4
Waterloo .....	47008	536	11.4	49	1.0	58	1.2	27	.6
Welland .....	34948	307	8.7	42	1.2	39	1.1	6	.1
Wellington .....	72808	702	9.6	74	1.0	74	1.0	49	.6
Wentworth .....	73649	1224	16.6	137	1.8	86	1.1	59	.8
York .....	168408	3586	21.3	336	2.0	240	1.4	248	1.4
	2115971	23184	11.0	2419	1.14	2121	1.0	1664	.8



the ten highest Causes of Death, with their ratio to Population in 1886.

PNEUMONIA.		DIPHTHERIA.		HEART DISEASE.		CONVULSIONS.		DIARRHÆA.		ENTERITIS.		PARALYSIS.	
No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.
12	.5	18	.8	7	.3	7	.3	7	.3	5	.2	1	.05
40	1.0	32	.8	24	.6	14	.4	10	.2	16	.4	22	.6
39	.5	6	.08	15	.2	9	.1	13	.2	17	.2	12	.1
71	1.0	57	.8	78	1.1	25	.3	80	1.1	27	.3	32	.4
18	.8	15	.6	7	.3	9	.4	3	.1	7	.2		
15	.3	28	.6	24	.5	8	.1	3	.6	8	.1	15	.3
50	.9	102	2.0	22	.4	7	.1	19	.3	13	.2	14	.2
17	.3	22	.5	42	.9	20	.4	12	.2	14	.3	12	.2
40	.5	9	.1	30	.4	10	.1	12	.1	12	.1	14	.1
17	.2	7	.2	12	.4	3	.1	5	.1	5	.1	14	.5
23	.9	12	.5	14	.5	9	.3	6	.2	2	.08	9	.3
2	.3	14	2.0	2	.3	1	.1	1	.1	1	.01	1	.01
21	.3	12	.2	21	.3	15	.2	3	.05	8	.1	9	.1
41	.4	11	.1	45	.5	17	.2	13	.1	16	.2	19	.2
40	.6	40	.6	40	.6	9	.1	24	.4	19	.3	14	.2
37	.7	39	.7	24	.4	12	.2	19	.3	11	.2	5	.08
30	.8	15	.4	17	.4	4	.1	8	.2	5	.1	4	.1
32	.5	21	.3	36	.5	10	.1	17	.2	21	.3	8	.1
7	.2	22	.7	11	.4	3	.1	2	.06	6	.2	10	.3
31	.9	9	.2	25	.7	12	.4	9	.2	4	.1	17	.5
78	.7	51	.5	55	.5	23	.2	24	.2	31	.3	27	.2
24	.8	28	.9	14	.4	14	.5	6	.2	9	.3	1	.03
23	.6	8	.2	21	.5	12	.3	12	.3	6	.1	3	.03
43	.5	16	.2	32	.4	9	.1	12	.1	20	.2	21	.2
27	.5	16	.3	14	.2	21	.4	8	.1	11	.2	11	.2
52	.9	14	.2	39	.7	18	.3	5	.09	14	.2	17	.3
21	.7	13	.4	15	.5	2	.07	1	.03	2	.07	14	.4
55	.9	13	.2	26	.4	16	.2	13	.2	14	.2	10	.1
33	1.0	21	.6	9	.2	13	.4	18	.5	12	.3	7	.2
11	.2	159	3.8	13	.3	5	.1	5	.1	4	.09	5	.1
9	.3	9	.4	18	.7	5	.2			8	.3	3	.1
14	.3	64	1.4	10	.2	3	.06	7	.1	8	.2	4	.09
30	.3	51	.6	27	.3	21	.2	18	.2	19	.2	17	.2
29	.4	45	.6	14	.2	9	.1	21	.3	10	.1	13	.2
21	.5	13	.3	13	.1	10	.2	2	.05	13	.3	8	.2
49	1.0	16	.3	22	.4	26	.5	26	.5	15	.3	8	.1
12	.3	14	.4	24	.7	9	.1	6	.1	5	.1	11	.3
59	.8	19	.2	37	1.0	22	.3	11	.1	15	.2	20	.2
95	1.2	117	1.5	54	.7	26	.3	42	.5	30	.4	18	.2
239	1.4	228	1.3	137	.8	154	.9	100	.6	53	.3	57	.3
1507	.71	1406	.66	1090	.51	622	.29	603	.28	516	.24	507	.23



TABLE 21.—Showing the Population and Deaths in each City ;

CITIES.	Population according to Assessors.	Total Deaths.	Ratio to Population.	NERVOUS DISEASES.		PNEUMONIA & BRONCHITIS.		PHTHISIS.		ANÆMIA.	
				No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.
Toronto.....	118403	2850	24.2	340	2.8	339	2.8	294	2.4	251	2.1
Hamilton.....	41712	768	18.4	74	1.7	83	1.9	91	2.1	46	1.8
Ottawa.....	34857	1100	31.5	89	2.5	87	2.5	96	2.7	143	4.1
London.....	26047	389	14.9	49	2.8	47	1.8	31	1.1	23	.9
Kingston.....	15827	282	17.7	24	1.5	31	1.9	32	2.0	19	1.2
Brantford.....	12570	193	15.3	33	2.6	26	2.0	22	1.7	3	.2
St. Thomas.....	10127	137	13.5	16	1.5	11	1.1	14	1.3	17	1.6
Guelph.....	10216	182	17.8	16	1.5	24	2.3	15	1.0	21	2.0
St. Catharines.....	9779	172	17.6	22	2.2	14	1.4	24	2.4	15	1.5
Bellville.....	10076	150	14.8	29	2.8	12	1.1	17	1.6	3	.3
Stratford.....	9069	125	13.7	15	1.6	22	2.4	6	.6	11	1.2
Total.....	298683	6348	21.2	707	2.36	696	2.3	642	2.07	552	1.8

TABLE 22.—Showing the Population and Deaths in each Town ; also

TOWNS.	Population by Assessors.	Number of Deaths.	Ratio to Population.	PHTHISIS.		NERVOUS DISEASES.*		PNEUMONIA.*		OLD AGE.	
				No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.
Kincardine.....	2886	43	14.9	7	2.4	3	1.0	2	.6	7	2.4
Windsor.....	7336	130	17.7	8	1.1	12	1.6	12	1.6	7	.9
Owen Sound.....	5672	87	15.3	5	.9	3	.5	13	2.2	4	.7
Goderich.....	3927	40	10.1	4	1.0	8	2.0	4	1.0	3	.7
Chatham.....	8457	119	14.0	19	2.2	11	1.3	13	1.5	11	1.3
Sarnia.....	5288	60	11.3	6	1.1	3	.5	7	1.3	1	.2
Perth.....	3930	81	20.6	10	2.2	9	2.2	6	1.5	7	1.7
Napanee.....	3414	50	14.6	11	3.2	11	3.2	4	1.1	1	.3
Brockville.....	8320	149	17.9	21	2.5	18	2.1	9	1.0	11	1.3
Cobourg.....	4940	39	8.0	7	1.4	5	1.0	5	1.0	6	1.2
Port Hope.....	5514	46	8.4	6	1.1	10	1.8	3	.5	6	1.8
Whitby.....	3023	36	11.9	4	1.2	5	1.6	3	1.0	4	1.3
Woodstock.....	6718	60	9.0	6	.8	10	1.5	5	.7	4	.6
Brampton.....	3313	76	22.9	9	2.3	9	2.3	4	1.2	10	3.0
Peterborough.....	8149	121	14.8	8	1.0	21	2.5	18	2.2	6	.7
Cornwall.....	5710	74	12.9	13	2.1	4	.7	8	1.4	2	.3
Pictou.....	2825	50	17.7	6	2.0	1	.3	7	2.4	6	2.1
Barrie.....	4412	57	12.9	3	.7	5	1.1	10	2.2	6	1.3
Pembroke.....	3666	83	22.6	5	1.3	7	1.9	6	1.6	4	1.1
Lindsay.....	5512	59	10.7	9	1.6	12	2.1	5	.9	4	.7
Berlin.....	5343	72	13.4	6	1.1	8	1.4	3	.5	15	2.8
Galt.....	6322	93	14.7	15	2.3	7	1.1	19	3.0	6	.9
Orangeville.....	3100	69	22.2	4	1.3	1	.3	5	1.6	5	1.6
Paris.....	3311	47	14.1	7	2.1	6	1.7	1	.3	4	1.2
Total.....	121088	1741	14.3	199	1.6	189	1.5	172	1.4	140	1.1

\*Nervous diseases include Infantile Convulsions. \*Pneumonia

also the ten highest causes of death with their ratio to Population.

DIPHTHERIA.		OLD AGE.		HEART DISEASES.		DIARRHŒAL DISEASES.		ENTERITIS AND GASTRITIS.		CHOLERA INFANTUM.	
No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.
177	1.5	128	1.0	136	1.1	106	.9	96	.8	76	.6
78	1.8	28	.7	37	.8	44	1.0	39	.9	28	.6
38	1.1	53	1.5	44	1.2	76	2.2	32	1.0	26	.7
19	.7	16	.6	18	.7	11	.4	14	.5	12	.4
9	.5	33	2.1	14	.9	9	.5	9	.5	5	.3
14	1.1	10	.8	17	1.3	7	.5	7	.5	2	.1
8	.7	6	.6	7	.7	2	.2	6	.6	12	1.1
5	.4	17	1.6	16	1.5	8	.8	5	.5	1	.1
5	.5	9	.9	7	.7	2	.2	3	.3	11	1.1
1	.1	20	2.0	9	.9	1	.1	3	.3	4	.4
1	.1	13	1.4	6	.6	6	.6	4	.4	3	.3
355	1.2	333	1.1	311	1.04	272	.9	218	.7	180	.6

the ten highest causes of Death, with their ratio to Population in 1886.

ANÆMIA.		DIPHTHERIA.		HEART DISEASE.		ENTERITIS.		DIARRHŒA AND DYSENTERY.		KIDNEY DISEASE.	
No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.	No. of Deaths.	Ratio to Population.
13	4.5	23	3.1	2	.7	5	.6	3	.4	1	.4
18	2.4			9	1.2					1	.1
9	1.5			6	1.0	13	2.2	2	.3	2	.3
3	.7			1	.2	4	1.0			2	.5
4	.4	8	.9	5	.6	7	.8	3	.3	4	.4
2	1.5	7	1.3	3	.5	1	.2	3	.5	2	.3
5	1.2	3	.7	3	.7			3	.7		
		2	.6	2	.6	3	.7	1	.3	1	.3
11	1.3	3	.3	10	1.2	7	.8	8	.9	4	.4
1.	2.0			10	2.0					2	.4
				3	.5	3	.5	1	.1	3	.5
4	1.3			1	.3	1	.3	1	.3	2	.6
7	1.0	1	.1	3	.4	2	.2			6	.8
6	1.8	3	.9	6	1.8			2	.6	1	.3
3	.3	16	1.9	2	.2	6	.5	1	.1	4	.4
8	1.4	7	1.2	1	1.7	5	.8	7	1.2	2	.3
6	2.1	1	.3	3	1.0	6	2.1			1	.3
		3	.7	2	.4	1	.2	4	.9	4	.9
3	.8	29	7.9	2	.5	4	1.0	2	.5	2	.5
		6	1.0	6	1.1	1	.1			1	.1
7	1.3			1	.1	3	.5	3	.5	2	.3
1	.1	4	.6	7	1.1	3	.5	3	.5		
12	4.0	2	.6	1	.3	1	.3			1	.3
3	.9			2	.6	2	.6	5	1.5	1	.3
132	1.0	118	.98	91	.7	78	.6	66	.5	49	.4

includes Bronchitis. \*Anæmia includes Infantile Debility.

TABLE 23.—Showing the Population and Deaths in the rural districts of each

COUNTIES.	Population.	Total No. of Deaths, 1886.	Ratio to Population.	OLD AGE.	
				No. of Deaths.	Ratio to 1000 of Population.
Algoma .....	22350	234	10.4	10	.4
Brant .....	19787	188	9.5	26	1.3
Bruce .....	68075	466	6.8	47	.7
Carleton .....	32171	386	12.0	53	1.6
Dufferin .....	19180	169	8.8	21	1.9
Elgin .....	35457	236	6.6	31	.8
Essex .....	43143	630	13.1	35	.8
Frontenac .....	29401	274	9.3	31	1.0
Grey .....	71341	494	6.9	63	.8
Haldimand .....	27490	225	8.2	25	.9
Halton .....	24119	243	10.0	13	.5
Haliburton .....	6511	43	6.6	.....	.....
Hastings .....	49627	347	7.0	36	.7
Huron .....	79856	541	6.7	57	.7
Kent .....	50464	407	8.0	32	.6
Lambton .....	51421	488	9.4	29	.5
Lanark .....	33050	294	8.9	42	1.2
Leeds and Grenville .....	57027	505	8.8	62	1.0
Lennox and Addington .....	25375	159	6.2	23	.9
Lincoln .....	23962	259	10.7	32	1.4
Middlesex .....	73737	652	8.7	80	1.0
Muskoka and Parry Sound .....	39924	304	10.1	20	.7
Norfolk .....	36880	322	8.9	36	1.0
Northumberland and Durham .....	73630	589	8.0	80	1.1
Ontario .....	50368	437	8.6	49	.9
Oxford .....	47782	459	9.6	46	.9
Peel .....	25146	220	8.7	33	1.3
Perth .....	49079	412	8.3	45	.9
Peterborough .....	24305	200	8.2	20	.8
Prescott and Russell .....	41826	668	15.1	45	1.7
Prince Edward .....	20040	232	11.5	31	1.5
Renfrew .....	40237	340	8.4	36	.8
Simcoe .....	77541	530	6.8	56	.7
Stormont, Dundas and Glengarry .....	66337	515	7.7	79	1.1
Victoria .....	30957	237	7.6	21	.6
Waterloo .....	34179	371	10.8	37	1.0
Welland .....	34948	307	9.0	39	1.1
Wellington .....	61573	520	8.4	57	.9
Wentworth .....	27764	456	16.4	58	2.0
York .....	38165	736	19.2	112	3.2
Total .....	1654223	15095	9.1	1648	1.0

County; also the five highest causes of Death, with their ratio to Population.

PHTHISIS.		DIPHTHERIA.		DIARRHOEAL AFFECTIONS.		TYPHOID FEVER.	
No. of Deaths.	Ratio to 1000 of Population.	No. of Deaths.	Ratio to 1000 of Population.	No. of Deaths.	Ratio to 1000 of Population.	No. of Deaths.	Ratio to 1000 of Population.
17	.8	18	.8	10	.4	1	.04
15	.7	18	.9			6	.3
53	.8	6	.09	13	.2	9	.1
44	1.3	19	.6	9	.3		
9	.4	13	.7	4	.2	1	.05
25	.7	20	.5	1	.02	5	.1
69	1.6	79	1.8	19	.4	21	.5
28	.9	13	.4	3	.1	2	.07
38	.5	9	.1	13	.1	3	.04
18	.6	7	.2	5	.2	2	.7
24	1.0	12	.5	7	.2	3	.1
		14	.2	1	.1		
45	.9	11	.2	2	.04	6	.1
62	.7	11	1.3	23	.3	12	.1
39	.7	32	.6	24	.4	4	.08
43	.8	32	.6	22	.4	11	.2
30	.9	12	.3	7	.2	2	.06
81	1.4	18	.3	10	.2	4	.07
24	.9	20	.8	1	.03	4	.1
30	1.2	4	.1	7	.3	4	.1
78	1.0	32	.4	21	.2	14	.2
21	.7	28	.9	8	.2	1	.03
43	1.1	8	.2	14	.4	16	.2
78	1.0	16	.2	13	.1	5	.06
47	.9	16	.3	11	.2	11	.2
52	1.1	13	.2	8	.1	13	.2
22	.8	10	.4	3	.1	4	.1
44	.9	12	.2	13	.2	14	.3
21	.8	5	.2	5	.2	2	.08
41	1.0	159	.3	6	.1	2	.04
35	1.7	8	.2			5	.2
36	.9	35	.8	7	.1	3	.07
55	.7	48	.6	15	.2	5	.06
70	1.0	38	.5	18	.2	6	.09
24	.7	7	.2	5	.1	2	.06
28	.8	12	.3	23	.6	2	.06
42	1.2	14	.4	6	.2	10	.3
59	.9	14	.2	6	.1	9	.1
46	1.6	39	.1	7	.2	10	.3
42	1.1	51	.1	8	.1	13	.3
1578	.95	933	.56	378	.23	247	.15

TABLE 24.

## DEATHS BY OCCUPATIONS.

Average Age - - - - 57.5 years.

List of those who died over the Average Age. Number 3,264.

OCCUPATIONS.	No. of Deaths.	Average Age at Death.	OCCUPATIONS.	No. of Deaths.	Average Age at Death.
Dentists . . . . .	1	77 yrs.	Masons . . . . .	46	61.5 yrs.
Coopers . . . . .	21	70 "	Tailors . . . . .	48	61.0 "
Gentlemen . . . . .	214	69 "	Miners . . . . .	10	60.2 "
Volunteers, Soldiers, etc . . . . .	47	68.5 "	Gardeners . . . . .	34	59.6 "
Weavers . . . . .	30	64.7 "	Shoemakers . . . . .	89	59.2 "
Clergymen . . . . .	33	63.5 "	Teachers, male . . . . .	38	58.0 "
Farmers . . . . .	2642	62.8 "	Bricklayers . . . . .	11	57.8 "

List of those who died under the Average Age. Number 2,536.

OCCUPATIONS.	No. of Deaths.	Average Age at Death.	OCCUPATIONS.	No. of Deaths.	Average Age at Death.
Millwrights . . . . .	7	57.1 yrs.	Hunters and Fishermen . . . . .	13	45.6 yrs.
Plasterers . . . . .	15	56.0 "	Lawyers . . . . .	22	45.0 "
Contractors and Builders . . . . .	30	55.8 "	Pedlars . . . . .	7	44.7 "
Tanners and Curriers . . . . .	7	55.5 "	Engineers . . . . .	35	44.5 "
Carpenters . . . . .	173	55.3 "	Editors . . . . .	3	44.3 "
Bakers and Confectioners . . . . .	21	55.1 "	Saddlers and Harness-makers . . . . .	18	44.0 "
Manufacturers . . . . .	46	54.3 "	Painters . . . . .	28	43.8 "
Millers . . . . .	31	54.1 "	Watchmakers and Jewellers . . . . .	13	43.2 "
Physicians . . . . .	36	54.0 "	Musicians . . . . .	7	43.0 "
Labourers . . . . .	795	53.4 "	Servants (Female) . . . . .	77	42.7 "
Brewers and Distillers . . . . .	11	53.0 "	Moulders . . . . .	20	42.6 "
Merchants . . . . .	150	53.0 "	Lumbermen . . . . .	30	42.5 "
Butchers . . . . .	45	53.0 "	Tinsmiths . . . . .	19	41.4 "
Chemists and Druggists . . . . .	15	52.1 "	Stonecutters . . . . .	13	41.0 "
Brickmakers . . . . .	8	51.8 "	Machinists . . . . .	40	40.3 "
Carriage and Waggon-makers . . . . .	37	51.0 "	Artists . . . . .	11	38.7 "
Cabinet-makers . . . . .	18	50.8 "	Printers . . . . .	22	38.2 "
Public Officials . . . . .	90	50.0 "	Barbers . . . . .	16	37.4 "
Bankers . . . . .	14	50.0 "	Book-keepers . . . . .	123	37.3 "
Blacksmiths . . . . .	75	49.0 "	Milliners and Dressmakers . . . . .	27	35.6 "
Sailors . . . . .	35	47.0 "	Provincial Land Surveyors . . . . .	2	35.0 "
Agents . . . . .	38	47.0 "	Railroad Employees . . . . .	55	35.0 "
Other Mechanics . . . . .	82	46.3 "	Seamstresses . . . . .	30	34.8 "
Teamsters . . . . .	38	46.2 "	Telegraph Operators . . . . .	4	31.6 "
Tavern-keepers . . . . .	56	45.8 "	Tobacconists . . . . .	9	29.2 "
Cooks . . . . .	3	45.6 "	Teachers (Female) . . . . .	16	25.2 "



TABLE 25.

A STATISTICAL CLASSIFICATION of the number of Deaths of persons whose occupations were specified (not including Farmers' Wives and Housewives) and giving the Number, Aggregate and Average Age.

OCCUPATIONS.	NUMBER OF PERSONS.	AGES AT DEATH.	
		Aggregate.	Average.
CLASSES AND OCCUPATIONS.			
I. CULTIVATORS OF THE SOIL .....	2676	168164	62.8 years.
II. MECHANICS .....	1016	53300	52.4 "
III. LABOURERS .....	840	44625	53.1 "
IV. MERCHANTS, FINANCIERS, ETC. ....	476	22400	47.0 "
V. PROFESSIONAL MEN. ....	508	29476	58.0 "
VI. OTHER EMPLOYMENTS .....	150	7416	49.4 "
VII. FEMALES AT WORK .....	134	5301	39.5 "
Total .....	5800	330682	37.0 "
CLASS I.—CULTIVATORS OF THE SOIL.			
Farmers .....	2642	166135	62.8 year
Gardeners .....	34	2029	59.6 "
Total Class I .....	2676	168164	62.8 "
CLASS II.—MECHANICS.			
Blacksmiths .....	75	3684	49.0 years.
Brickmakers .....	8	415	51.8 "
Brewers and Distillers .....	11	588	53.4 "
Bricklayers .....	11	636	57.8 "
Barbers .....	16	599	37.4 "
Butchers .....	45	2386	53.0 "
Bakers and Confectioners .....	21	1158	55.1 "
Carpenters .....	173	9577	55.3 "
Cabinet-makers .....	18	915	50.8 "
Carriage and Waggon-makers .....	37	1886	51.0 "
Coopers .....	21	1469	70.0 "
Cooks .....	3	137	45.6 "
Contractors and Builders .....	30	1676	55.8 "
Masons .....	46	2832	61.5 "
Machinists .....	40	1615	40.3 "
Moulders .....	20	855	42.6 "
Millers .....	31	1677	54.1 "
Millwrights .....	7	400	57.1 "
Miners .....	10	602	60.2 "
Other Mechanics .....	82	3756	46.0 "
Painters .....	28	1229	43.8 "
Printers .....	22	842	38.2 "
Plasterers .....	15	840	56.0 "
Stone-cutters .....	13	534	41.0 "
Shoemakers .....	89	5276	59.2 "
Saddlers and Harness-makers .....	18	800	44.4 "
Tinsmiths .....	19	788	41.4 "
Tobacconists .....	9	263	29.2 "
Tailors .....	48	2932	61.0 "
Tanners and Curriers .....	7	389	55.5 "
Watchmakers and Jewellers .....	13	562	43.2 "
Weavers .....	30	1942	64.7 "
Total Class II .....	1016	53300	52.4 "



TABLE 25—Continued.

OCCUPATIONS.	NUMBER OF PERSONS.	AGE AT DEATH.	
		Aggregate.	Average.
CLASS III.—LABOURERS.			
Labourers .....	795	42554	53.4
Pedlars .....	7	313	44.7
Teamsters .....	38	1758	46.2
Total Class III .....	840	44625	53.1
CLASS IV.—MERCHANTS, ETC.			
Agents .....	38	1786	47.0
Book-keepers, Salesmen and Clerks .....	123	4606	37.3
Bankers .....	14	701	50.0
Chemists and Druggists .....	15	782	52.1
Manufacturers .....	46	2484	54.3
Merchants .....	150	7944	53.0
Tavern-keepers .....	56	2569	45.8
Telegraph Operators .....	4	126	31.6
Lumbermen .....	30	1402	42.5
Total Class IV .....	476	22400	47.0
CLASS V.—PROFESSIONAL MEN.			
Artists .....	11	427	38.7
Clergymen .....	33	2096	63.5
Dentists .....	1	77	77.0
Engineers .....	35	1560	44.5
Editors .....	3	133	44.3
Lawyers .....	22	990	45.0
Musicians .....	7	301	43.0
Physicians .....	36	1943	54.0
Public Officials .....	90	4503	50.0
Provincial Land Surveyors .....	2	70	35.0
Teachers, Male .....	38	2209	58.0
“ Female .....	16	404	25.2
Gentlemen .....	214	14763	69.0
Total Class V .....	508	29476	58.0
CLASS VI.—OTHER EMPLOYMENTS.			
Hunters and Fishermen .....	13	593	45.6
Railroad Employees .....	55	1958	35.0
Sailors .....	35	1645	47.0
Volunteers, Soldiers and Pensioners .....	47	3220	68.5
Total Class VI .....	150	7416	49.4
CLASS VII.—FEMALES AT WORK.			
Domestic Servants .....	77	3293	42.7
Milliners and Dressmakers .....	27	962	35.6
Seamstresses .....	30	1046	34.8
Total Class VII .....	134	5301	39.5

## No. 1.

Diagram showing the ratio of Births to each 1000 of the Population in each County of the Province in 1886.

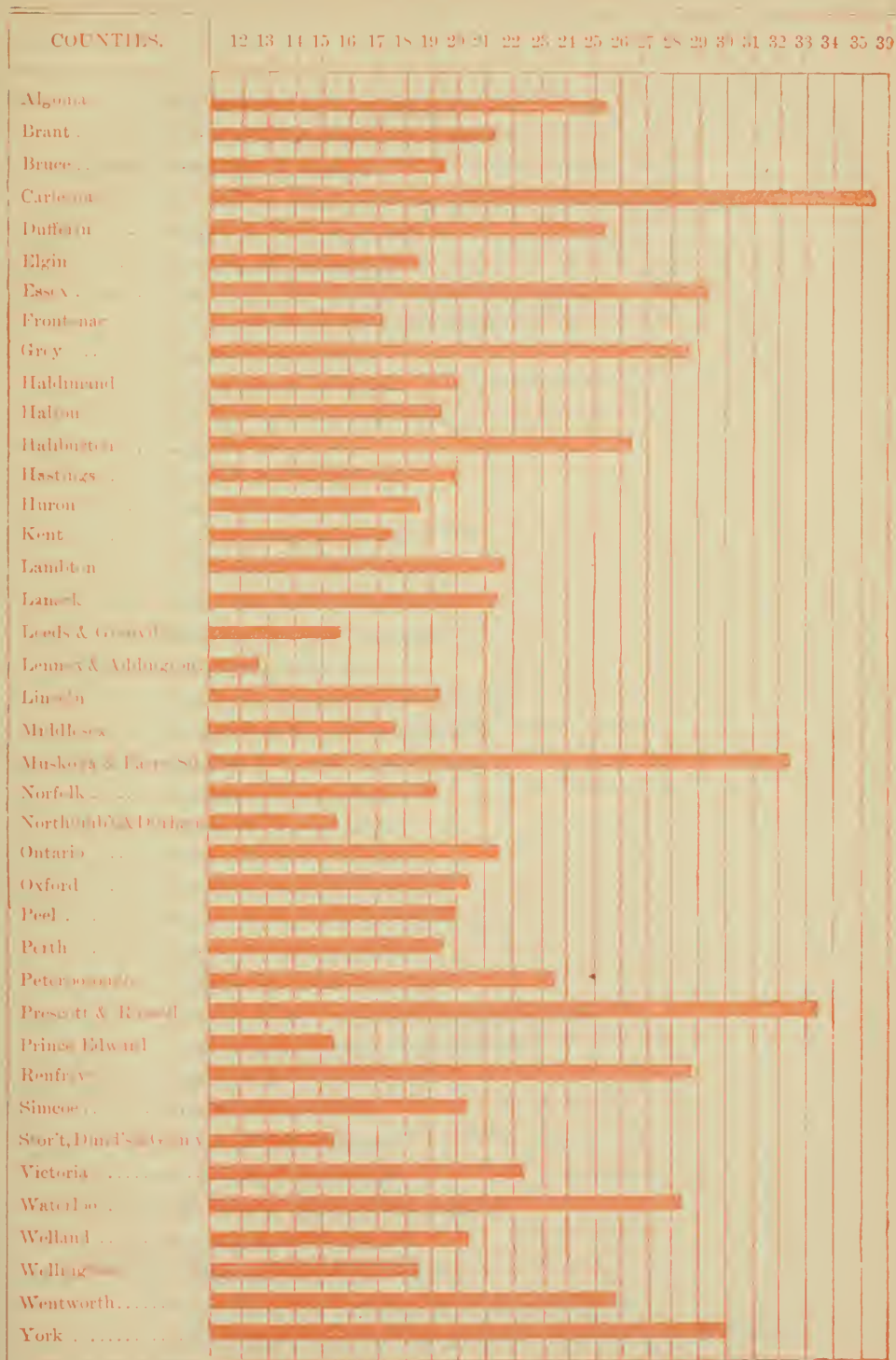


Diagram showing the ratio of Births to each 1000 of the Population in each City and Town in the Province in 1896.



The figures at the top of the portion line or lines indicate the ratio of births to each 1000 of the population during the year. The spaces are fractional parts of one.

Diagram showing the ratio of Deaths to each 1000 of the Population in each County of the Province in 1886.

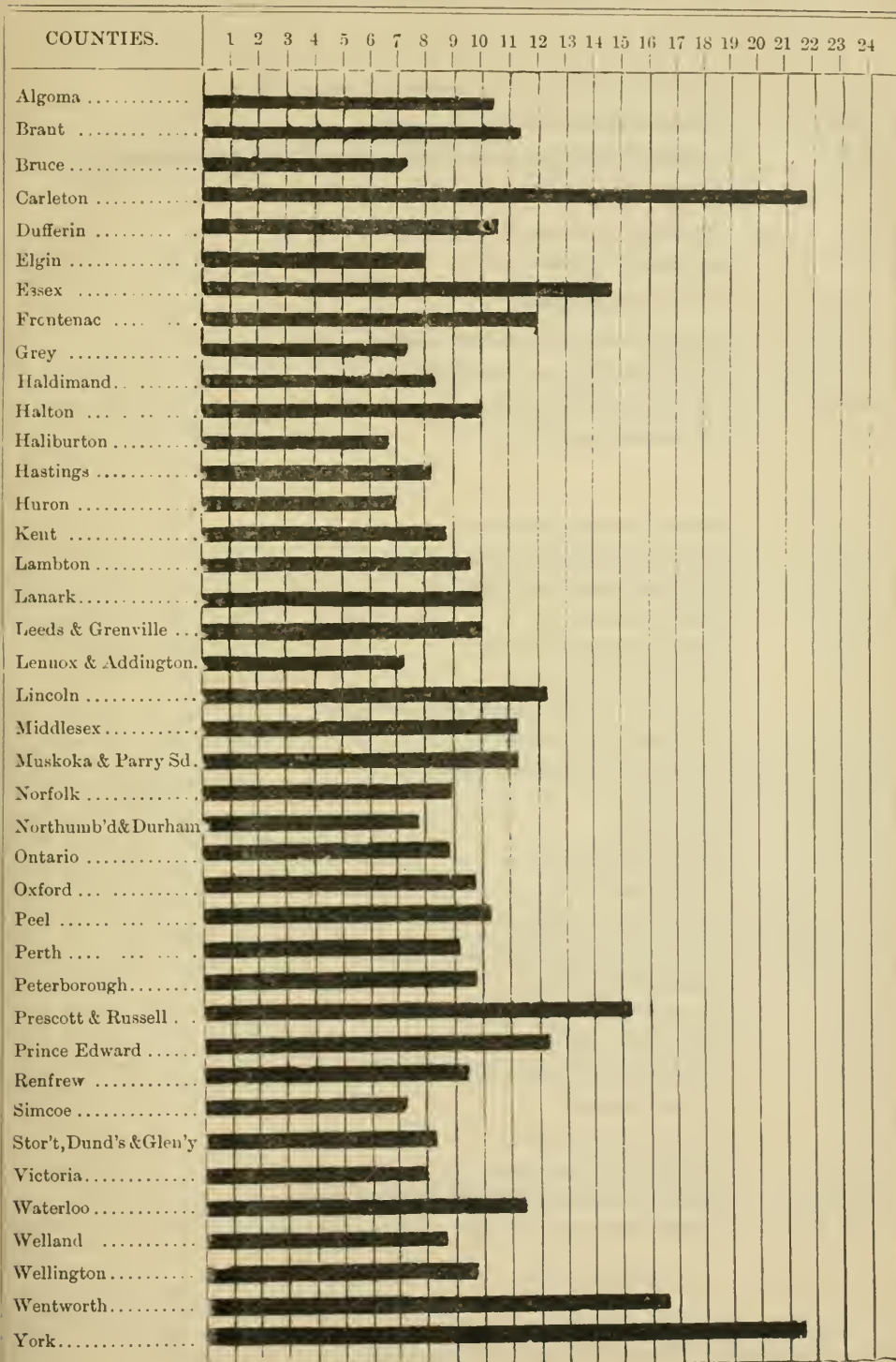
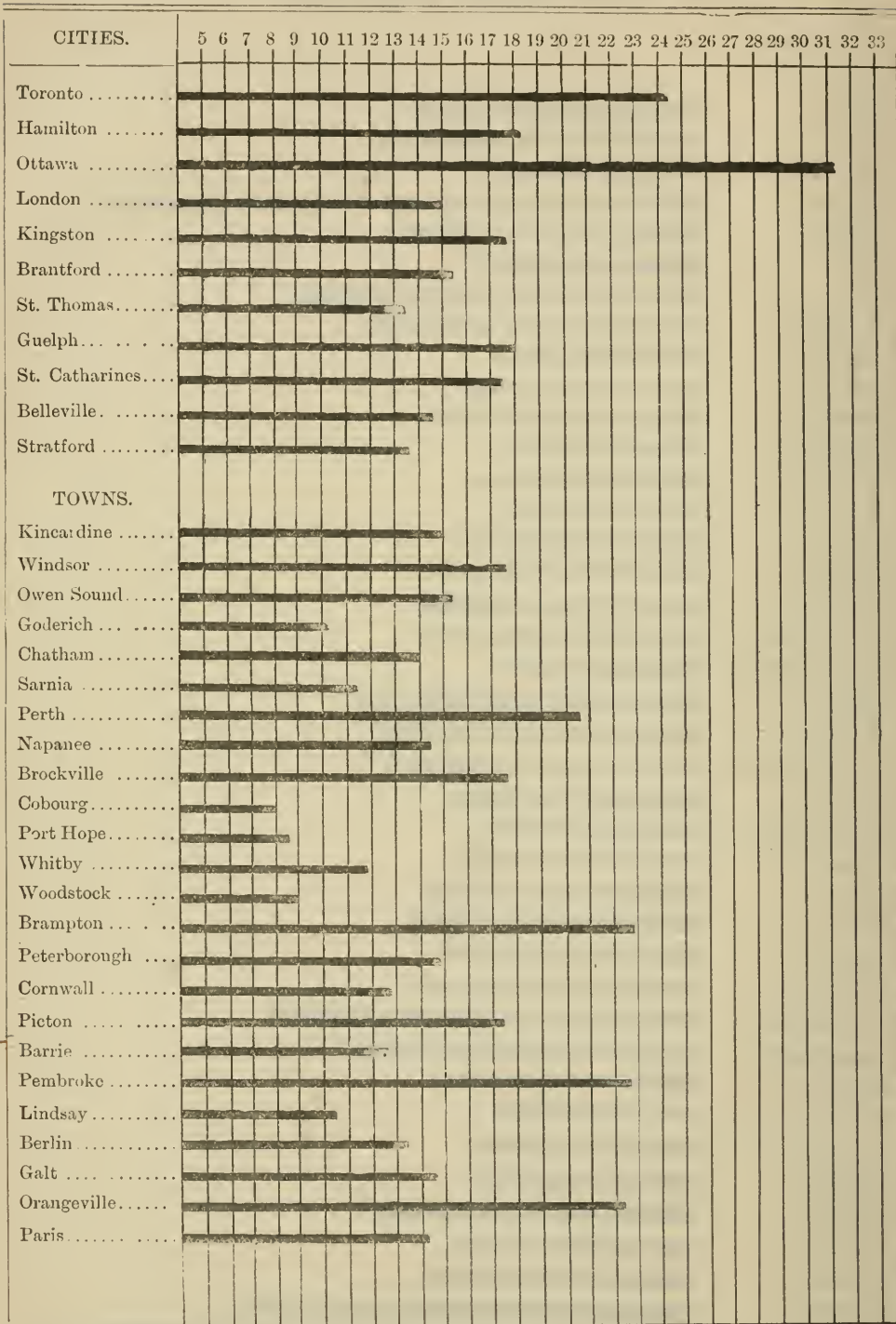




Diagram showing the ratio of Deaths to each 1000 of the Population in each City and Town in the Province in 1886.



The figures at the top of the perpendicular line indicate the ratio of deaths during the year to each 1000 of the population. The spaces are fractional parts of one.

## REMARKS ON THE TABLES OF DEATHS.

Tables showing the causes of death, the ages and months of those who died in each city, town, and also for the rural districts apart from the Province, have been compiled (see Appendix, Table G page C. to CLXIII.) with the object of comparing the ratio of death from different diseases in those divisions. Abstracts and deductions will be found in Tables 20, 21, 22 and 23, pages 28 to 33 inclusive.

As the population of the Province increases, so will the number of deaths naturally increase; if the ratio of increase, however, is not exceptionally high, it does not predicate an unhealthy condition of the Province.

A comparison between the mortality in the year 1882 with that in 1886 appears to prove this. In 1882 (the year in which the census of 1881 was used) the population of the Province was 1,923,610, the deaths registered numbered 21,800, or a ratio of 11.3 per 1,000 of the population; in 1886 the number of deaths registered was 23,184, an increase of 1,384 deaths, the ratio being 11.0 per 1000, slightly lower than in 1882, although the population is estimated to have increased to 2,115,971 in 1886.

*(See Tables 1, 2 and 3.)*

There was an increase of 1,076 deaths in 1886, principally in the following Counties, which contain the large cities:—York, including Toronto, 593; Carleton, including Ottawa, 230 and Wentworth, including Hamilton, 127. The principal decreases were in the Counties of Northumberland and Durham (united), 182; Hastings, 129; Welland, 70; and Peterborough, 60.

## CITIES.

The returns show that the mortality increases proportionately more rapidly in cities than in the rural districts. The total number of deaths in the eleven cities in 1882 was 5,031; the population was 239,888, and the ratio 20.2 per 1000. In 1886 the deaths numbered 6,348, and the population was 298,683, giving a ratio of 21.2 per 1,000; this shows an increase of 1,317 deaths; of population, 58,795; and of ratio, 1.0 per 1,000; whereas, in the whole Province for the same period, although there was an increase both of deaths and population, the ratio per 1,000 had not increased. Every city, except Belleville, returned an increase in the number of deaths in 1886, principally the City of Toronto, where the increase was 457. There was also a large increase in the returns of deaths from Ottawa, viz., 173. This city has always returned the highest death rate of the cities. One of the causes is that a large number of the deaths which take place in the Hospitals and other Institutions in the city are of those who were temporary residents of Ottawa at the time of death. If the deaths of these temporary residents were kept separate for the purpose of statistics, the true death-rate of the city would not appear so exceptionally high.

## TOWNS.

The following towns returned the highest increase in the number of deaths, viz. Pembroke, 37; Orangeville, 33; Owen Sound, 32; and Windsor, 28; and the towns returning the largest decrease were Lindsay, 13; Picton, 7; and Napanee and Whitby, 6 each.

The highest mortality to population was in Brampton, 22.9 per 1000; Pembroke, 22.6 per 1,000; Orangeville, 22.2 per 1000; and Perth, 20.6 per 1000.

There was one death in every 91.2 of the population of the Province, one in every 47 in the cities, one in every 70 in the towns, and one in every 109.5 in the rural districts.



## SEX.

*(See Table 14.)*

There were registered during the year the deaths of 11,922 males and 11,262 females. The death-rate of the males was 11 per 1,000, of the females 10·8 per 1,000, slightly below the average rates for the last six years. The proportion between the males and females was as 1,058·6 males to 1,000 females.

## SEASONS.

*(See Tables 14 and 15.)*

The influence of the seasons upon mortality is shown in tables 14 and 15. They present the number and percentage of deaths in each month and quarter of the year. The mortality was the highest in March, but numerically not so large as in 1885. The number of deaths registered in September was 417 more than in that month in the previous year, causing it to rank second in the order of deaths by months. In 1885, September ranked lowest but one. This large increase in the number of deaths was owing to the more than average mortality from Cholera Infantum, Diarrhœal diseases and Diphtheria during that month. The deaths were the most numerous in the first quarter of the year, and the least in the second. Last year the fourth quarter returned the lowest number of deaths.

## AGES.

*(See Table 16.)*

Table 16 shows the percentage of decedents in each division of ages to the whole number of deaths in each of the last six years, also the total number of deaths. There was an increase in the period under five years of 944; also, an increase of 206 in the period between five and ten years, being a total increase in these two periods of 1,150 deaths. There was, however, a decrease in nearly all the other periods. The large increase in the early periods of life was principally in the cities, as they returned 220 more deaths under one year, 393 more in the period between one and five years, and 57 more in the period from five to ten years, a total increase in those places in the three periods of 670, of which Ottawa returned 135. The number and percentage of deaths of persons over seventy years of age to the total mortality was as follows:—In the cities, 708 persons died at that age, 11·1 per cent. of all the deaths; in the towns, 256, or 14·7 per cent.; and in the rural districts, 2,946, or 19 per cent., showing that the largest percentage of deaths of persons over seventy years of age died in the rural districts.

## CENTENARIANS.

The return of persons dying at the age of 100 years and over is given in Table 18. It will be noticed that two of them are reported as having reached the extraordinary age of 120 years, and in one case to 121 years. Enquiries were made respecting these centenarians and, with the exception of the case of Mary Webb, whose birth is recorded in the family bible as having been born in Tyrone, Ireland, November 2nd, 1774, no reliable evidence has been furnished to establish that the parties named were of the ages given at the time of death.

## NATIONALITY OF DECEDENTS OVER 60 YEARS OF AGE.

There were 5,703 persons registered whose ages at death were over sixty years, an increase in the number so returned in 1885 of 168. Nearly 30 per cent., or 1,705, were Irish; 1,199, or 21 per cent., were English; 1,146, or 20 per cent., were Canadians; 949, or 16·6 per cent., were Scotch; 315, or 5·5 per cent., were Americans, and the remainder were Germans, French, and Swiss.

Table showing the Five Highest Causes of Death in Each Period of Age.

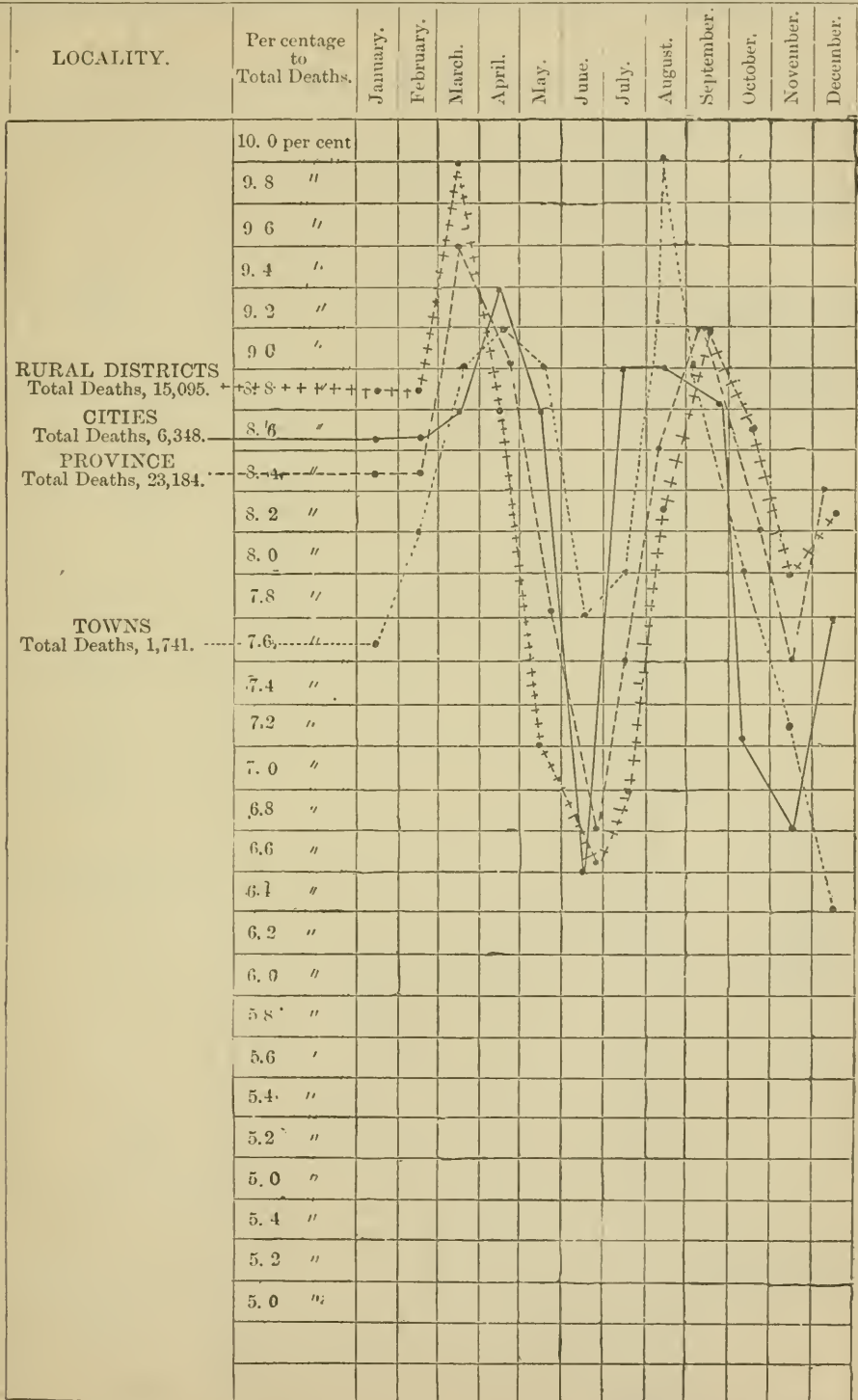
Age.	Total deaths.	1.	2.	3.	4.	5.
Under one year.....	5293	Anæmia..... 1273	Diarrhoea..... 476	Convulsions .... 471	Cholera Infantum. 370	Pneumonia..... 258
1 to 5 years.....	2895	Diphtheria..... 580	Croup..... 252	Pneumonia..... 235	Anæmia..... 166	Scarlet Fever... 147
5 " 10 " .....	1157	Diphtheria..... 470	Croup..... 74	Pneumonia..... 66	Teething..... 52	Scarlet Fever... 50
10 " 15 " .....	594	Diphtheria..... 147	Phthisis..... 36	Pneumonia..... 32	Typhoid Fever... 30	Heart disease... 22
15 " 20 " .....	834	Phthisis..... 235	Pneumonia..... 59	Diphtheria..... 57	Typhoid Fever... 55	Heart disease... 41
20 " 30 " .....	2049	Phthisis..... 872	Pneumonia..... 138	Typhoid Fever.. 101	Heart disease... 75	Enteritis..... 37
30 " 40 " .....	1521	Phthisis..... 462	Pneumonia..... 128	Heart disease... 92	Typhoid Fever... 58	Enteritis..... 37
40 " 50 " .....	1333	Phthisis..... 261	Pneumonia..... 114	Heart disease... 89	Cancer..... 52	Apoplexy..... 39
50 " 60 " .....	1376	Phthisis..... 191	Pneumonia..... 124	Heart disease... 134	Cancer..... 83	Paralysis..... 58
60 " 70 " .....	1693	Heart disease... 206	Paralysis..... 140	Cancer..... 135	Pneumonia..... 133	Phthisis..... 122
70 " 80 " .....	2163	Old Age..... 895	Heart disease... 183	Paralysis..... 122	Pneumonia..... 122	Dropsy..... 85
80 " 90 " .....	1747	Old Age..... 1226	Paralysis..... 73	Heart disease... 52	Pneumonia..... 51	Dropsy..... 43
Not stated.....	619	.....	.....	.....	.....	.....
Total.....	23184	.....	.....	.....	.....	.....

This table shows the principal causes of death, according to priority, in each period of age. It will be seen that Anæmia, Diarrhœa, and Convulsions were the prevailing cause of death in the period under one year. In the next period, between one and five years, Diphtheria ranked as the highest cause of death, with Croup and Pneumonia second and third, and they occupied the same position in the periods from five to ten years and from ten to fifteen years, with the exception that Phthisis takes the place of Croup in the latter period. In the next five periods, ending at sixty years, Phthisis and Pneumonia rank first and second as the principal causes of death in all of those periods. Heart disease held the third place in three of these periods, and Diphtheria and Typhoid Fever were each third in the fifth and sixth period of age respectively. In the period between sixty and seventy years, Heart Disease was the most fatal, Paralysis second, and Cancer third. Between seventy and eighty years 42 per cent. of all the deaths were from old age. The next highest was Heart Disease, followed by Paralysis. In the next and last period, eighty years and over, Old Age again ranks as the highest cause of death, Paralysis second, and Heart Disease third. Scarlet Fever, Enteritis, Apoplexy, and Dropsy did not either of them rank higher than the fifth cause of death in any period.

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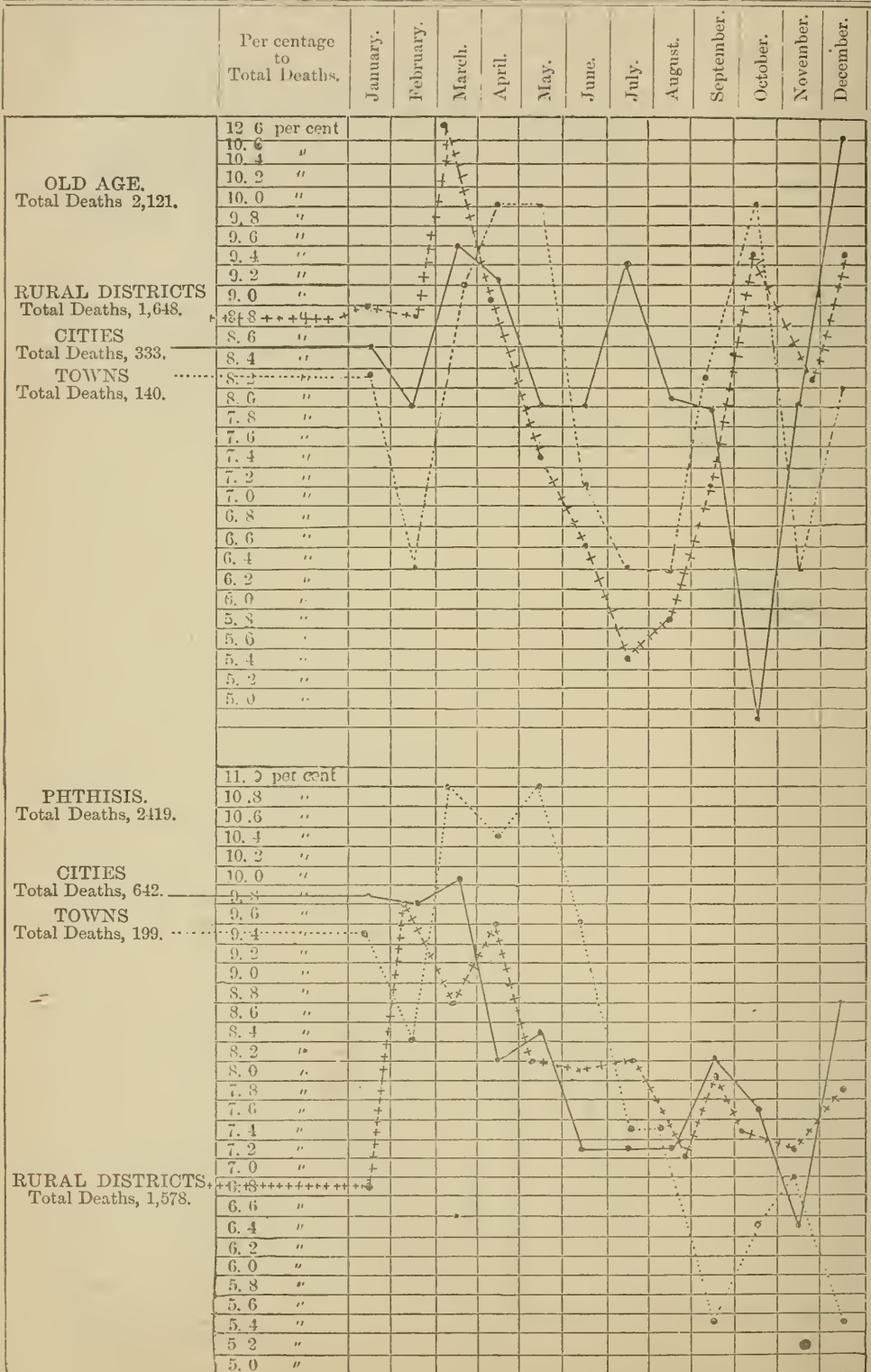
# No. 1.

## Death Wave in the Province, in the Cities, Towns and Rural Districts for 1886..



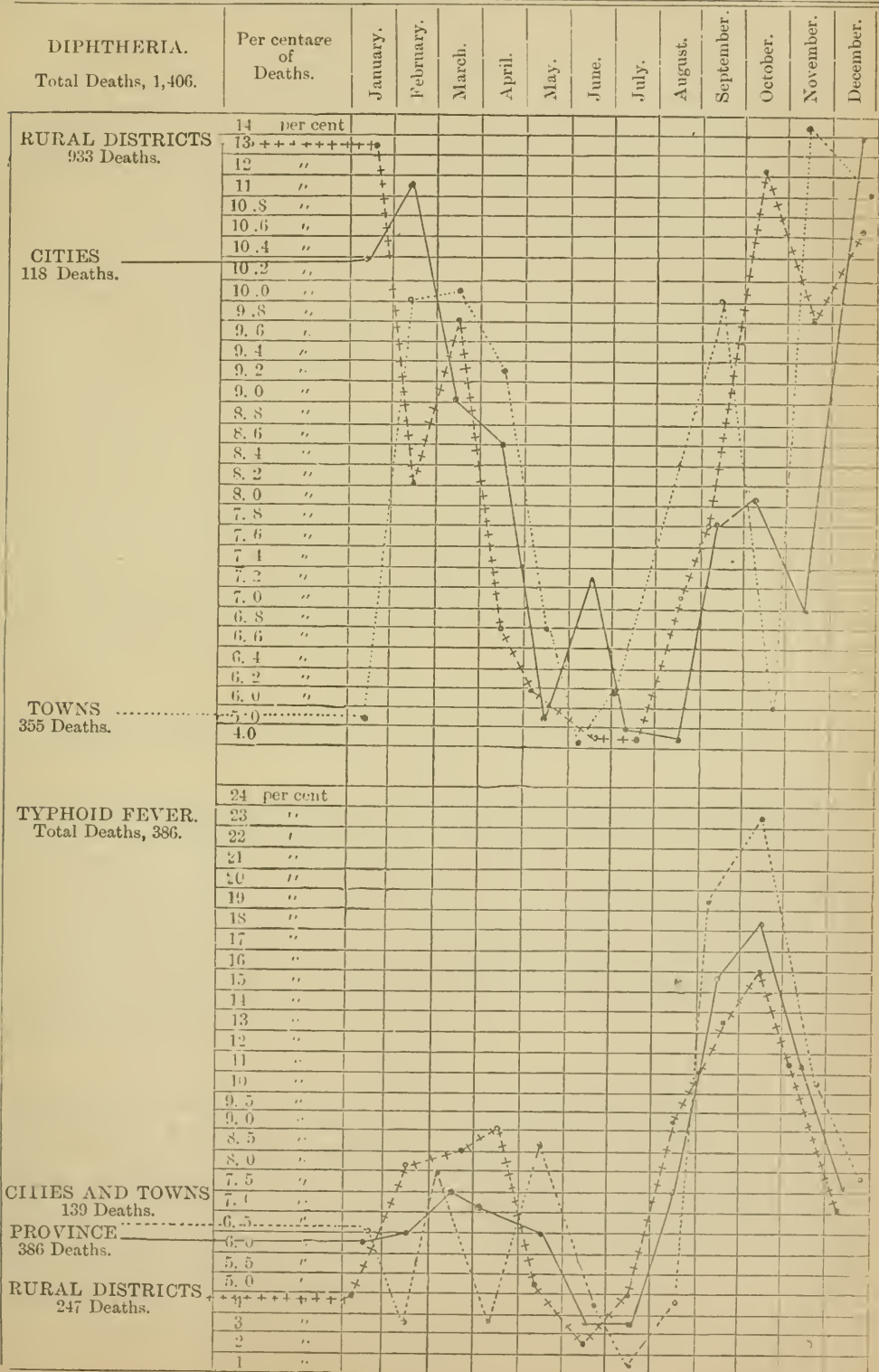
Designed by F. WARWICK.

The Following Diagrams present a Comparison of the Per Centages of Deaths from





## Old Age, Phthisis, Diphtheria and Typhoid Fever in each month of the year 1886.







## EXPLANATION OF DIAGRAMS.

*(Diagram No. 1.)*

## DEATH WAVE 1886.

The percentage of mortality in each of the four divisions of the Province is shown in this diagram.

The following is an explanation of the various lines:—The four divisions of the Province are indicated by different lines, viz., the Province by short straight lines — — —, the cities by a continuous straight line —, the towns by dotted lines . . ., and the rural districts by crosses + +. The round dot on these lines in each column indicates the percentage of deaths in each month, *i. e.*, in the month of January a dot is placed on the line for the Province opposite the figure 7·6 in the column of the percentages, therefore, 7·6 per cent. of all the deaths in the Province took place in January. In like manner, the dot on the line for the cities in January is opposite 8·6, therefore, 8·6 per cent. of all the deaths in the cities were in that month; and similarly the dots on the lines for the towns and rural districts show the percentage of deaths in those places. In the same manner, the dots on the different lines in the other months show the percentage of deaths in each of the months.

The two high points of mortality were for the Province, in March and September; and they were the same in the rural districts. In the cities, the two high points of mortality were in April and July, and, in the towns, in April and August. The largest percentage of deaths in these high points was, in the towns in August, 10·2 per cent., and the lowest, in the cities in July, 9·0 per cent., a difference of 1·2 per cent. between those two high points. The two low points in the death wave were the same in the Province, in the cities, and in the rural districts, viz., June and November. In the towns, the low points of mortality were in January and December.

The lowest of these low points was in the towns, 6·4 in December, and the highest in the Province, 7·7 per cent. in November.

*Diagrams 2 and 3,*

Percentage of deaths from Old Age, Phthisis, Diphtheria and Typhoid Fever.

## OLD AGE.

It will be seen that the percentage of mortality from Old Age was the highest in March in the rural districts, being 12·6 per cent. of all the deaths from that cause in those localities; in the cities it was the highest in December, 10·6 per cent., not quite so high as in the rural districts. The highest percentage, 9·8 per cent. in the towns, was in April; it was also the same in May and October. The lowest percentage of deaths from Old Age was in the cities in October, 4·5 per cent.; it was nearly as low, 5·4 per cent. in June, in the rural districts. In the towns the lowest points reached were 6·4 per cent. in February, June, July and November. The difference in the mortality from Old Age in the cities in the months of October and December was remarkable, 4·5 per cent. in the former month and 10·6 per cent. in the latter.

## PHTHISIS.

In comparing the mortality from this disease in the cities and towns with the rural districts, it will be seen that the percentage of deaths was the greatest in the month of March in the cities and towns—more particularly in the towns, as 11 per cent. died in those places in March and also in May; while in the cities only 10 per cent. died in March and 8·4 per cent. in May. In the rural districts the deaths were the highest in February, 9·8 per cent. The towns also returned the lowest percentage, 5·5 in September; while in the cities the lowest point was in November, 6·4 per cent. In the rural districts the percentage did not in any month fall as low as in the cities or towns, the lowest point being 6·8 per cent. in January.

## DIPHTHERIA.

In this disease the towns reached the highest percentage in November, viz., 14; the next highest point was in the cities in December, viz., 14 per cent. The point in the rural districts was nearly the same, 13·5 per cent. in January. The mortality was also very large in October in the rural districts, reaching 12 per cent. The diagram also shows that the high points of death from Diphtheria in all three localities were in January, February, October, November and December, no locality returning less than 11·2 per cent. Again, in the three months June, July and August, the three localities were equally low, being 4 per cent. In the other months there was considerable variation in the percentage of mortality.

## TYPHOID FEVER.

The two high points of mortality from this fever in the Province, cities and towns and rural districts, were in September and October; the highest point reached in the cities and towns was in October, 23·5 per cent. of the total deaths from that fever in those localities.

In the Province and rural districts the highest point was also in October, 18·5 per cent. in the former and 16 per cent. in the latter.

The waves of mortality from this fever in the different localities start at a low point in January; they then rise and fall through the next six months, but not to any great extent; they ascend with great rapidity through August, September and October, and then as rapidly descend through November and December.

## CLASSIFIED CAUSES OF DEATH.

## CLASS I.—ZYMOTIC DISEASES.

(See Appendix, Table E: also, Tables 20, 21, 22 and 23.)

Thirty different diseases are included in this class, of which the principal were Diphtheria, Diarrhoeal diseases and Fevers. The total deaths in the whole Province in this class was 4,639; of males, 2,401, and of females, 2,238; the ratio to population was 2·1 per 1,000. In the cities the deaths numbered 1,302, or 4·3 per 1,000. In the towns 331 deaths, or 2·7 per 1,000, and in the rural districts 3,006 deaths, or 1·8 per 1,000.

## DIPHTHERIA.

The number of deaths from this cause was 1,406, an increase of 400 over the deaths from the same cause in 1885. This increase was principally in the following counties, viz., York, which increased 122; Renfrew, 41; Wentworth, 28; Middlesex, 27; Prescott and Russell (united), 25; Brant, 23; and Lambton, 21. The mortality from this disease has been excessive for several years in the Counties of Prescott and Russell (united), Essex and Renfrew, and no diminution appears in 1886, as the returns show that there were 159 deaths from this cause in Prescott and Russell (united), a ratio of 3·8 per 1,000 of the population; 102 deaths, or a ratio of 2·0 per 1,000 in Essex; and 64 deaths, or a ratio of 1·4 per 1,000 in Renfrew. The ratio for the whole Province was ·66 per 1,000.

The following Table exhibits the number of deaths in each county from Diphtheria during ten years, with the average mortality and ratio per 1,000.

The total deaths for the ten years was 9,445, the average per year, 944·5, and the average ratio to population, ·49. Eleven counties had higher ratios than this and twenty-eight lower. The two high points of mortality were in 1882 and 1886, and the two low points in 1879 and 1884. The year 1886 was the most fatal, and the year 1879 the least so.

## Deaths from Diphtheria in Each County During Ten Years, with Average and Ratio to Population.

COUNTIES.	Population.	1876.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	Total 10 years	Average	Average Ratio.
Algoma.....	20320	1	2	10	15	6	9	8	5	25	18	74	7.4	.36
Brant.....	33869	33	14	28	21	15	16	29	15	9	32	188	18.8	.55
Bruce.....	64774	20	20	21	54	35	26	13	4	3	6	176	17.6	.26
Carleton.....	64103	14	9	21	54	99	88	46	13	44	57	445	44.5	.70
Dufferin.....	20536	.....	.....	.....	.....	.....	6	1	4	1	15	45	7.5	.36
Elgin.....	42361	15	4	6	5	22	29	5	5	15	28	144	14.4	.34
Essex.....	46539	20	16	18	76	59	47	31	71	94	102	534	53.4	1.14
Frontenac.....	42555	3	39	9	8	11	20	5	14	13	22	144	14.4	.33
Grey.....	70528	20	83	18	18	33	25	13	15	.....	9	234	23.4	.33
Haliburton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14	14	7.6	.30
Haldimand.....	24991	17	2	5	5	16	9	6	1	8	7	76	7.6	.30
Halton.....	21919	17	9	7	4	7	8	7	7	3	12	81	8.1	.37
Hastings.....	55192	44	45	22	4	20	34	16	20	37	12	254	25.4	.46
Huron.....	76525	38	22	32	30	41	25	33	10	29	11	244	24.4	.32
Kent.....	54335	35	22	12	19	47	33	8	15	4	40	260	26.0	.47
Lambton.....	52034	4	37	20	14	29	18	11	8	29	39	198	19.8	.38
Leamark.....	33975	6	20	8	7	19	10	20	30	8	15	143	14.3	.42
Leeds and Grenville.....	60164	9	38	20	14	62	79	68	66	59	21	526	52.6	.87
Lennox and Addington.....	26484	27	16	.....	8	5	18	8	9	7	22	120	12.0	.45
Lincoln.....	31563	11	44	16	10	18	19	9	6	6	9	148	14.8	.46
Middlesex.....	93081	10	30	29	35	53	47	9	13	24	51	300	30.0	.32
Muskoka and Parry Sound.....	27204	11	5	2	10	11	10	7	5	12	28	101	10.1	.37
Norfolk.....	35527	38	19	14	23	24	22	7	.....	6	8	161	16.1	.48
Northumberland and Durham.....	77390	38	27	4	12	43	48	7	20	12	16	227	22.7	.29
Ontario.....	48812	18	4	2	12	21	25	21	21	11	16	151	15.1	.48
Oxford.....	50159	96	17	15	19	31	41	34	8	24	14	299	29.9	.59
Peel.....	26175	19	11	11	3	3	15	17	11	8	13	111	11.1	.42
Perth.....	53686	17	23	14	71	44	34	11	3	9	13	239	23.9	.44
Peterborough.....	34648	1	9	5	2	4	16	15	8	7	21	101	10.1	.29
Prescott and Russell.....	38022	2	84	42	45	34	27	26	18	134	159	571	57.1	1.50
Prince Edward.....	21045	2	8	5	5	12	48	3	4	6	9	102	10.2	.50
Simcoe.....	94903	16	1	3	21	45	28	22	21	23	64	244	24.4	.60
Stromont, Dundas and Glengarry.....	66017	31	32	18	49	31	33	20	28	51	51	344	34.4	.45
Victoria.....	25163	11	138	22	30	57	50	14	17	16	45	436	43.6	.66
Waterloo.....	42735	16	23	18	39	21	47	6	5	4	16	203	20.3	.35
Welland.....	31771	13	8	6	21	5	19	14	7	10	14	112	11.2	.35
Wellington.....	66189	52	29	23	18	50	37	22	12	22	19	284	28.4	.43
Wentworth.....	66552	77	29	36	35	27	29	26	63	89	117	428	42.8	.63
York.....	153098	48	43	50	51	78	117	85	54	106	228	860	86.0	.56
Totals.....	1925610	864	986	574	822	1171	1239	709	668	1006	1406	9445	944.5	.49



It is to be regretted that this disease has so largely increased during 1886, notwithstanding the energetic measures adopted by the Provincial Board of Health for its suppression; but it is fair to presume that if the sanitary measures recommended by the Board had not been adopted in many localities, the mortality, great as it was, would have been much greater. Municipalities have it in their power, by carrying out the provisions of the Health Act, to check, and, to a certain extent, root out this disease; but evidently there has been, in some localities, great apathy displayed in enforcing sanitary measures, and not until this disease becomes epidemic do they appear to realize the necessity of sanitary precautions. As Diphtheria belongs to the class of preventible diseases, the mortality from it should decrease instead of otherwise.

The fall and winter months are the most fatal. October, December, and January returned respectively 151, 159, and 170 deaths—67 more than the five months from April to August. The young are the principal victims from this disease. 1,146, or 81 per cent. of all, died under ten years of age.

The ratio to population of deaths from this cause in the 11 cities was 1·2 per 1,000, in the towns ·98, and in the rural districts ·56 per 1,000, showing that Diphtheria was more fatal in the cities and towns than in the rural districts.

The city of Hamilton returned the highest death rate, 1·8 per 1,000, and Toronto was next, 1·5 per 1,000. Ottawa and Brantford returned each 1·1 per 1,000, and London and St. Thomas each ·7 per 1,000. Belleville and Stratford returned only one death each.

The towns of Pembroke and Windsor suffered severely from an epidemic of Diphtheria in 1886, as 29 deaths, or a ratio of 7·9 per 1,000, were caused by it in the former town, and 23 deaths, or a ratio of 3·1 per 1,000 in the latter. It was also prevalent in the towns of Sarnia, Peterborough, Cornwall, and Lindsay, the ratios being above the average, ·98 per 1,000. No deaths from this cause were reported from eight towns.

In the rural districts, although the mortality was, on the whole, much less than in the cities and towns, yet in some localities it was very fatal. For instance, in the rural portion of the county of Essex the deaths numbered 79, or a ratio of 1·8 per 1,000 of the population; and, also, in the rural portions of the following counties the ratio was above the average, ·56 per 1,000, viz., Huron 1·3 per 1,000, Brant and Renfrew each ·9 per 1,000, and Algoma and Lennox and Addington ·8 per cent. per 1,000.

#### DIARRHOEAL DISEASES.

There was an increase of 187 deaths from Diarrhoea and Dysentery in 1886. Diarrhoea is most prevalent in those counties in which the large cities and towns are situated. July and August return the highest number of deaths from these two diseases. The young are chiefly the victims—492, or 82 per cent. of all, died from Diarrhoea under the age of five years. There were 70 people died from Diarrhoeal diseases at and over seventy years of age.

In the cities, Toronto returned the largest number of deaths—viz., 106—from these two diseases; but the proportion to population was the same as the average for the eleven cities, ·9 per 1,000. Hamilton and Ottawa returned a less number of deaths from the same causes, although the ratio was higher. In the former city the deaths were only 44, but the ratio to population was 1·0 per 1,000, and in the latter there were 76 deaths with a ratio of 2·2 per 1,000. In the other cities the ratio was below the average, although it was rather high in Guelph. The towns and rural districts returned a much lower death rate—·5 in the former, and ·23 per 1,000 in the latter.

#### FEVERS.

The total deaths from the various kinds of fever numbered 861—of males 451, and of females 410.

The deaths from Typhoid Fever were 386. A gradual falling off in the number of deaths from this fever has taken place since 1881. In 1881 the mortality from it was

616 ; in 1886, as above stated, the deaths were only 386, a decrease of 230, or 37 per cent. The ratio to population of the deaths from this fever in the whole Province was .18 per 1,000, in the cities .36 per 1,000, in the towns .24 per 1,000, and in the rural districts .15 per 1,000.

The cities of London, St. Catharines, Brantford, and Toronto returned a rather high death rate in proportion to their population from this fever—in London it was .53 per 1,000, in St. Catharines .5 per 1,000, in Brantford .47 per 1,000, and in Toronto .45 per 1,000. In the other cities the ratio was below the average.

The returns show that 260 deaths were registered from Scarlet Fever, a decrease of 54 as compared with 1885. This fever was prevalent in Toronto, Kingston and Ottawa, although not to a very great extent. The mortality was the lowest in the rural districts, numbering only 191, or .11 per 1,000 of the population. In the cities the deaths were 43 and ratio .14 per 1,000, and in the towns 26 deaths, or .21 per 1,000.

About the same mortality was returned from the other fevers in 1886 as in 1885.

#### CLASS II.—CONSTITUTIONAL DISEASES.

Thirteen diseases are included in this class, and they were the cause of 5,438 deaths—2,613 males and 2,825 females, a ratio of 2.5 per 1,000 of the population. In the cities the deaths in this class numbered 1,402, or a ratio of 4.7 per 1,000. In the towns there were 393 deaths, a ratio of 3.2 per 1,000 ; and in the rural districts, 3,643 deaths and a ratio of 2.2 per 1,000. The prominent diseases of this class are Phthisis, Anæmia, Cancer and Rheumatism.

##### PHTHISIS.

The excessive mortality from this disease continues. In 1886 the deaths from it were 2,419, an increase of 106 ; the ratio, however, was lower, 1.1 per 1,000 to 1.2 per 1,000 in 1885, in consequence of the increase in the population. The ratio in the cities was 2.07 per 1,000 ; in the towns, 1.6 per 1,000 ; and in the rural districts, .95 per 1,000.

The following counties have for some years returned a higher death rate from this cause than the average rate for the whole Province, viz., Brant, Carleton, Frontenac, Hastings, Prince Edward, Wentworth and York.

The mortality from Phthisis has always been greater among females, varying in different years. Thus, in 1884, there were 475 more deaths of females than males ; in 1883 there was only 258 more.

The most fatal period of life from this cause was between the ages of 20 and 40 years ; over fifty per cent. of all the deaths occurred during that period.

The months of February, March and April, are always dangerous months to those afflicted with this disease. In the Province the short month of February returned the highest number of deaths of any month, 236, and November the lowest, 171.

March returned the highest mortality in the cities, although January and February were nearly as fatal. In the towns Phthisis was the most prevalent in the months of March and May.

The city of Ottawa returned the highest ratio of deaths, 2.7 per 1,000 ; Toronto and St. Catharines were the next highest, 2.4 per 1,000 each. In all the other cities the ratio was below the average, 2.07 per 1,000.

In some of the towns the ratio of mortality from Phthisis was very high, viz., in Napanee it was 3.2 per 1,000 ; in Brockville, 2.5 per 1,000 ; in Kincardine, 2.4 per 1,000 ; in Brampton and Galt, each 2.3 per 1,000 ; and in Chatham and Perth, each 2.2 per 1,000. Whereas in the following towns the ratio was low, less than the average, 1.6 per 1,000, for all the towns, viz., Goderich and Peterboro', 1.0 per 1,000 each ; Owen Sound, .9 per 1,000 ; Woodstock, .8 per 1,000 ; and Barrie, .7 per 1,000.



The rural portions of York, Wentworth, Carleton, Lincoln, Essex and Leeds and Grenville (united), exhibit a high death rate from this cause, and the rural portions Brant, Elgin, Grey, Huron and Wellington, a comparatively low rate.

#### ANÆMIA.

This is a general term given as the cause of death of those dying from general debility, without any specific disease, or which has not been diagnosed. The deaths were principally amongst the young, 1,439, or 86 per cent. of all the deaths were of children under one year; the remainder were principally of persons between 20 and 70 years of age. The mortality was greatest in September and least in December.

#### CANCER.

Cancer, after increasing steadily for years, has, it appears, fallen off in 1886, the returns showing a decrease of deaths of 47 females and an increase of 24 males, leaving a total decrease of 23 deaths from this cause. There was also a small decrease in the return of deaths from Rheumatism.

#### CLASS III.—LOCAL DISEASES.

This class comprises 71 causes of death, and the mortality from them in the whole Province was 8,014—of males 4,293, and of females 3,721—a death rate of 3·7 per 1,000 of the population; in the cities there were 2,139 deaths, or 7·2 per 1,000; in the towns 597 deaths, or 4·9 per 1,000; and in the rural districts 5,278 deaths, or 3·1 per 1,000 of the population.

The chief diseases in this class were of the nervous system, such as Apoplexy, Paralysis, etc.; diseases of the circulatory system, as the various affections of the Heart, etc.; diseases of the respiratory organs, as Congestion of the Lungs, Bronchitis, and Pneumonia; diseases of the digestive system, such as Hepatic Disease, Enteritis and Gastritis, and Urinary diseases, etc., which include Kidney complaints.

#### NERVOUS DISEASES.

The total deaths from the different nervous diseases were about the same as in 1885, viz., 2,280. In two of them, however, Convulsions and Meningitis (inflammation of membranes of the Brain), there was an increase of 123 deaths; but in Necrencephalus (softening of the Brain) and Paralysis there was a decrease of 58 deaths.

In the cities, the deaths from nervous complaints increased 7 per cent.

#### CIRCULATORY SYSTEM.

There was an increase of 50 in the deaths from diseases of the circulatory system.

Nearly all the diseases of the circulatory system are connected with the Heart, and the mortality from diseases of that organ in 1886 numbered 1,090 as against 1,046 in 1885, an increase of only 44. The deaths attributable to Heart Disease are, however, becoming more prevalent in the Province every year. In 1870 they only numbered 213, therefore the increase in 1886 as compared with 1870 was 877, or 418 per cent. more. The ratio to population in 1870 was .1 per 1,000, in 1886 it was .5 per 1,000. Amongst the most potent causes of this increase is the so called progress in civilization with its attendant excitement and rush and business anxiety. It is about equally fatal in the sexes, as the deaths of 546 and 544 females were reported in 1886. The proportion of mortality from Heart Disease in the three divisions of the Province was, for the cities 311, or 1.04 per 1,000 of their population; for the towns 91, or a ratio of .98 per 1,000; for the rural districts 688 deaths, or a ratio of .41 per 1,000.

## RESPIRATORY SYSTEM.

Pneumonia and Bronchitis are the two most fatal diseases of the respiratory system. The mortality from them in 1886 was 2,005, an increase of 156. There was also an increase of 13 in the deaths from Congestion of the Lungs, another disease of the respiratory system. In the cities, the deaths from Pneumonia and Bronchitis increased by 93, in the towns the increase was 57, and in the rural districts 32. These two causes of death were not so fatal in the rural districts as in the cities and towns. In the cities and towns the ratio of deaths was 2.0 per 1,000, in the rural districts .1 per 1,000.

## URINARY DISEASES.

Diseases of the digestive and urinary systems show no great change in the number of deaths caused by them. The numbers were 1,296 in 1886 as against 1,327 in 1885, a decrease of 31 deaths, chiefly of Liver complaints. There was a small increase in the deaths from Enteritis and Gastritis.

## CLASS IV.—DEVELOPMENTAL DISEASES.

Eighteen diseases are grouped in this class, and they are composed of those incidental to childhood, to women, and to the old. There were 35 more cases of premature birth and fewer deaths from teething, and the returns show a decrease of 83 in the deaths from childbirth.

The deaths of those who died in 1886 over 70 years of age, without any special disease except that attendant upon old age, numbered 2121, an increase of 48 over the number so recorded in 1885.

## CLASS V.—VIOLENT DEATHS.

The eighteen causes of death in this class complete the 150 divisions of the classification of diseases in Table E. The deaths in this class numbered 760, as against 822 in 1885. The majority of these violent deaths were from wounds and drowning; 301 deaths from the former cause, and 170 from the latter. There were a few more cases of suicide, and a decrease in the number killed by cars.

## DEATHS BY OCCUPATIONS.

(See Table 24.)

There were 12,297 deaths at the age of 21 years and over in 1886, and of this number the occupations of 9614 were given. Deducting the farmers' wives, housewives, and those whose occupation were not distinctly given, there remains 5800 actual workers, 83 less than in 1885. Table 24 designates the particular occupation that they followed, and 66 different kinds of employment are given, of which 14 lived to be over the average age, which was 57.5 years, an increase of 1.1 year over the average in 1885. Amongst these 14 were male teachers, who appear for the first time in this list, their average age having increased from 49.6 years in 1885 to 58 years in 1886, whereas the ages of female teachers at the time of death have decreased.

The ages at which tailors, miners and bricklayers, died in 1886, was greater than in 1885, therefore, they now appear in the list of those who died at ages above the average; while the ages of brewers, millwrights and contractors having decreased, they are now classified with those who died under the average age.

## STATISTICAL CLASSIFICATION.

## CLASS I.—CULTIVATORS OF THE SOIL.

*(See Table 25.)*

There was only a difference of three in the number of deaths of tillers of the soil, two less of farmers and five more of gardeners; their average age was about the same as in 1885.

## CLASS II.—MECHANICS.

Of the 32 mechanical trades the average age of Coopers was the highest, 70 years. Weavers were next, 64.7 years, and Masons third, 61.5 years. Tobacconists were the lowest, 29.2 years, but there were only nine deaths amongst them.

The four trades Carpenters, Shoemakers, Blacksmiths and Tailors, generally grouped together, show an increase in their ages at death. They numbered together 385, being 30 more than in 1885, and their average age was 56.7 years as against 55.7 in 1885.

The returns show that painters and printers are short-lived, and in 1886 their ages at death were less than in 1885. Comparing those mechanics whose occupations were chiefly carried on out of doors with those whose work was within shops, factories, etc., the returns show that the former lived longer than the latter. Of the former 324 died at an average age of 55 years, while of the latter 610 died at an average age of 52 years. As in former years, some striking exceptions are noticed, viz., Weavers, Shoemakers, Tailors and Coopers, who, although indoor workers, were longer-lived than the out-door workers, their average age was 61 years.

## CLASS III.—LABOURERS.

The number of deaths in this class was 65 less than in 1885; but the average age was about the same.

## CLASS IV.—MERCHANTS, ETC.

The nine occupations included in this class returned 476 deaths, 24 less than in 1885; but the average length of life was 1.4 years longer. Several changes are observed in the age of some of the members of this class. The age of chemists and druggists in 1885 was only 33.5, in 1886 it was 52.4 years. The ages of telegraph operators increased from 24.1 years in 1885 to 31.6 years in 1886; manufacturers from 50.6 to 54.3 years; while the tavern keepers, bankers, manufacturers who died in 1886 were not so long lived as those who died in 1885.

## CLASS V.—PROFESSIONAL MEN.

There were registered in 1886 the deaths of 508 persons belonging to this class, 71 less than in 1885; but their average age was slightly higher. Only 1 dentist died in 1886; his age was 77 years. Two died in 1885 at an average age of 61 years. There was an increase of 8 years in the ages of male teachers and engineers. Editors, lawyers, musicians, and those designated as gentlemen averaged the same age as in 1885. There was a decrease in the ages of female teachers, public officials, physicians, and artists, especially in the ages of female teachers. In 1885 their average age was 36.5 years, in 1886 it was only 25.2 years; but there were 15 less deaths of them. The average age of the members of the three professions, divinity, law, and medicine, was 55.2 years, nearly two years less than in 1885, caused by a decrease of five years in the average age of physicians. Clergymen have always attained a greater age than lawyers and doctors.

## CLASS VI.—OTHER EMPLOYMENTS.

Many of the occupations included in this class are attended, more or less, with danger to life, and therefore their average ages were low, only 40 years. There was the same number of deaths of railroad employees, but their average age was 6 years less.

## CLASS VII.—FEMALES AT WORK.

The deaths in this class were not so numerous as in 1885, but their average age was higher by 2.3 years. There was an increase in the ages of servants and milliners and dressmakers of 5 and 3 years respectively. Seamstresses show a decrease in their average age of 7 years.

I have the honor to be,

Sir,

Your obedient Servant,

H. S. CREWE,

*Inspector.*



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# APPENDIX.

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BIRTHS.

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TABLE A.—BIRTHS BY MONTHS, 1886.

COUNTIES.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	No. of Pairs of Twins.	Triplets.	Illegitimate.	Still Born.
Algonia and Thunder Bay :																	
Males.....	21	24	30	28	28	16	25	20	28	24	26	27	300	1	.....	2	4
Females.....	28	25	33	21	23	26	26	25	12	17	21	19	276	2	.....	4	1
Total.....	52	49	63	49	51	42	51	45	40	41	47	46	576	3 pairs.	.....	6	5
Brant :																	
Males.....	41	43	34	36	32	23	40	40	40	40	28	25	422	7	2	9	7
Females.....	22	21	40	30	31	31	29	31	39	36	30	30	370	7	1	5	2
Total.....	63	64	74	66	63	54	69	71	79	76	58	55	792	7 pairs.	1 case.	14	9
Bruce :																	
Males.....	50	69	65	80	73	53	61	48	57	54	53	51	714	13	.....	6	2
Females.....	54	64	63	71	66	63	54	46	73	51	32	59	696	11	.....	4	3
Total.....	104	133	128	151	139	116	115	94	130	105	85	110	1410	12 pairs.	.....	10	5
Carleton :																	
Males.....	125	140	134	127	131	109	133	122	99	110	99	116	1445	15	.....	80	10
Females.....	104	128	125	112	115	120	101	109	92	91	95	116	1308	21	.....	110	8
Total.....	229	268	259	239	246	229	234	231	191	201	194	232	2753	18 pairs.	.....	190	18
Dufferin :																	
Males.....	23	16	35	42	19	35	31	23	18	14	17	30	303	4	.....	1	2
Females.....	29	15	25	32	11	29	26	18	18	21	14	29	267	4	.....	2	2
Total.....	52	31	60	74	30	64	57	41	36	35	31	59	570	4 pairs.	.....	3	4
Elgin :																	
Males.....	44	36	37	41	42	46	37	32	34	44	32	40	465	11	.....	3	1
Females.....	39	37	29	34	30	49	32	24	37	43	24	27	405	3	.....	2	3
Total.....	83	73	66	75	72	95	69	56	71	87	56	67	870	7 pairs.	.....	5	4

Essex :	Males.....	76	66	72	71	72	57	55	73	58	70	57	51	781	9	.....	3	3
	Females.....	68	68	74	65	66	42	45	57	77	52	45	62	721	11	.....	4	2
Total.....		144	134	146	136	138	99	100	130	135	122	102	116	1502	10 pairs.	.....	7	5
Frontenac :	Males.....	42	32	39	33	20	36	21	30	38	36	27	34	391	7	.....	3	3
	Females.....	33	33	25	30	30	33	37	35	33	38	36	21	384	5	.....	2	3
Total.....		75	65	64	63	50	69	61	65	71	74	63	55	775	6 pairs.	.....	5	6
Grey :	Males.....	73	52	74	55	62	61	59	66	54	69	56	62	743	12	.....	2	2
	Females.....	72	61	70	51	53	68	55	56	46	66	57	52	707	14	.....	4	3
Total.....		145	113	144	106	115	129	114	122	100	135	113	114	1450	13 pairs.	.....	6	5
Haldimand :	Males.....	20	20	28	32	25	17	26	25	30	21	25	23	292	5	.....	4	3
	Females.....	30	18	21	24	17	21	27	18	21	17	26	18	258	1	.....	3	2
Total.....		50	38	49	56	42	38	53	43	51	38	51	41	550	3 pairs.	.....	7	5
Halton :	Males.....	25	16	20	29	15	21	24	16	19	22	22	20	249	5	.....	2	1
	Females.....	15	18	10	25	15	27	17	11	21	29	22	14	224	1	.....	1	2
Total.....		40	34	30	54	30	48	41	27	40	51	44	34	473	3 pairs.	.....	3	3
Haliburton :	Males.....	10	8	12	8	6	6	3	10	5	5	6	5	84	2	.....	1	.....
	Females.....	4	12	6	5	12	11	11	5	6	7	4	6	89	2	.....	.....	1
Total.....		14	20	18	13	18	17	14	15	11	12	10	11	173	2 pairs.	.....	1	1
Hastings :	Males.....	62	48	63	66	54	50	56	48	44	46	50	52	639	6	.....	1	2
	Females.....	41	46	68	47	66	58	46	67	60	42	38	47	626	10	.....	3	1
Total.....		103	94	131	113	120	108	102	115	104	88	88	99	1265	8 pairs.	.....	4	3
Huron :	Males.....	61	65	77	67	76	60	65	79	59	63	58	66	796	6	.....	3	2
	Females.....	65	64	55	60	65	57	52	90	66	71	60	56	761	8	.....	6	3
Total.....		126	129	132	127	141	117	117	169	125	134	118	122	1557	7 pairs.	.....	9	5

TABLE A.—BIRTHS BY MONTHS, 1886—Continued.

COUNTIES.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	No. of Twins.	Triplets.	Illegitimate.	Still Born.
<b>Kent:</b>																	
Males .....	47	43	47	56	39	36	36	45	51	43	45	45	533	6	.....	3	3
Females .....	43	49	60	38	34	49	53	55	41	33	28	31	505	12	.....	3	2
Total .....	90	92	107	94	73	76	89	100	92	76	73	76	1038	9 pairs.	.....	6	5
<b>Lambton:</b>																	
Males .....	57	46	62	49	54	54	39	60	53	50	62	55	641	9	.....	2	3
Females .....	47	48	57	51	60	43	50	61	57	56	37	37	604	7	.....	3	1
Total .....	104	94	119	100	114	97	89	121	110	106	99	92	1245	8 pairs.	.....	5	4
<b>Leamington:</b>																	
Males .....	40	37	36	38	36	35	32	36	28	34	34	29	415	6	.....	4	2
Females .....	30	40	30	47	26	26	31	29	29	31	25	32	376	2	.....	3	1
Total .....	70	77	66	85	62	61	63	65	57	65	59	61	791	4 pairs.	.....	7	3
<b>Leeds and Grenville:</b>																	
Males .....	49	43	43	39	40	41	51	36	43	38	37	45	505	4	.....	3	3
Females .....	40	38	55	42	43	38	50	56	50	39	44	47	542	8	.....	4	3
Total .....	89	81	98	81	83	79	101	92	93	77	81	92	1047	6 pairs.	.....	7	6
<b>Lennox and Addington:</b>																	
Males .....	26	17	19	14	11	15	11	17	19	17	14	12	192	3	1	3	2
Females .....	16	15	11	11	19	17	16	12	19	12	13	19	180	5	2	2	3
Total .....	42	32	30	25	30	32	27	29	38	29	27	31	372	4 pairs, 1 case.	.....	5	5
<b>Lincoln:</b>																	
Males .....	25	20	29	35	26	28	33	35	29	24	21	26	331	9	.....	6	3
Females .....	22	31	25	31	22	32	30	36	36	27	34	12	338	5	.....	3	4
Total .....	47	51	54	66	48	60	63	71	65	51	55	38	669	7 pairs.	.....	9	7

Middlesex :	Males ..	88	71	88	85	73	83	82	76	75	82	52	88	943	16	.....	15	8
	Females ..	80	64	92	66	80	68	81	60	73	75	58	58	855	16	.....	12	7
	Total .....	168	135	180	151	153	151	163	136	148	157	110	146	1798	16 pairs.	.....	27	15
Muskoka and Parry Sound :	Males ..	45	39	43	39	46	45	43	42	46	39	29	36	492	9	.....	2	2
	Females ..	35	29	45	36	42	49	50	31	39	38	48	35	477	13	.....	3	3
	Total .....	80	68	88	75	88	94	93	73	85	77	77	71	969	11 pairs.	.....	5	5
Norfolk :	Males ..	42	20	39	30	23	26	36	41	28	29	26	28	368	2	.....	4	1
	Females ..	24	23	25	44	23	23	31	31	34	28	27	27	340	4	.....	1	2
	Total .....	66	43	64	74	46	49	67	72	62	57	53	55	708	3 pairs.	.....	5	3
Northumberland and Durham :	Males ..	60	60	55	57	68	46	56	62	45	51	56	62	678	10	.....	2	2
	Females ..	53	50	49	65	63	41	59	60	54	50	53	53	650	10	.....	3	3
	Total .....	113	110	104	122	131	87	115	122	99	101	109	115	1328	10 pairs.	.....	5	5
Ontario :	Males ..	58	49	37	57	67	47	41	38	56	52	49	57	608	10	.....	2	2
	Females ..	50	51	51	44	44	37	42	45	43	40	48	39	534	6	.....	3	2
	Total .....	108	100	88	101	111	84	83	83	99	92	97	96	1142	8 pairs.	.....	5	4
Oxford :	Males ..	61	32	55	48	51	41	39	52	41	44	53	47	564	14	.....	4	2
	Females ..	50	48	48	53	48	56	39	49	38	46	37	45	557	16	.....	5	1
	Total .....	111	80	103	101	99	97	78	101	79	90	90	92	1121	15 pairs.	.....	9	3
Perth :	Males ..	20	25	22	18	26	17	26	36	28	29	23	29	299	5	.....	1	1
	Females ..	16	26	33	23	11	17	20	25	35	19	10	34	269	5	.....	1	1
	Total .....	36	51	55	41	37	34	46	61	63	48	33	63	568	5 pairs.	.....	2	2
Perth :	Males ..	43	39	53	53	44	43	40	41	70	54	40	49	569	5	.....	2	3
	Females ..	50	42	59	36	40	50	39	62	54	47	41	49	569	7	.....	1	3
	Total .....	93	81	112	89	84	93	79	103	124	101	81	98	1138	6 pairs.	.....	3	6



TABLE A.—BIRTHS BY MONTHS, 1886.—Continued.

COUNTIES.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	No. of Pairs of Twins.	Triples.	Illegimates.	Still Born.
Peterborough:																	
Males.....	36	27	33	41	58	41	30	29	39	32	33	34	433	1			1
Females.....	21	32	21	37	42	35	26	23	31	36	25	25	354	7			
Total.....	57	59	54	78	100	76	56	52	70	68	58	59	787	4 pairs			1
Prescott and Russell:																	
Males.....	64	76	76	56	57	58	65	76	66	55	47	44	740	18		3	2
Females.....	43	65	69	66	61	51	51	58	55	57	55	39	670	6		1	2
Total.....	107	141	145	122	118	109	116	134	121	112	102	83	1410	12 pairs		4	4
Prince Edward:																	
Males.....	24	10	22	12	14	14	9	23	19	13	20	18	198	3			
Females.....	15	17	10	14	15	8	14	17	14	9	12	14	159	3			
Total.....	39	27	32	26	29	22	23	40	33	22	32	32	357	3 pairs			
Renfrew:																	
Males.....	58	45	71	65	51	53	66	57	56	50	39	48	659	10		6	3
Females.....	56	46	65	51	40	45	50	49	50	48	41	43	587	6		1	2
Total.....	114	91	136	119	91	98	116	106	106	98	80	91	1246	8 pairs		7	5
Sinclair:																	
Males.....	69	55	79	78	77	71	77	70	70	76	65	71	858	11		2	4
Females.....	63	65	70	75	58	81	71	76	66	68	67	69	829	17		2	3
Total.....	132	120	149	153	135	152	148	146	136	144	132	140	1687	14 pairs		4	7
Stormont, Dundas and Glengarry:																	
Males.....	60	57	61	52	45	46	38	48	47	46	50	44	594	4		1	
Females.....	38	66	51	48	44	34	37	44	50	54	41	39	549	12		1	
Total.....	98	123	112	100	89	80	75	92	97	100	94	83	1143	8 pairs		2	1

Victoria:	42	39	43	39	34	23	37	38	36	48	43	21	36	448	8	.....	3	2
Males.....	33	37	33	34	23	38	38	36	32	32	32	26	21	383	1	.....	4	1
Females.....																		
Total.....	75	76	76	73	57	61	75	74	80	75	75	47	57	826	6 pairs	.....	7	3
Wentworth:																		
Males.....	32	51	67	62	63	53	54	65	54	54	42	54	49	666	9	.....	10	7
Females.....	58	56	62	55	57	41	55	61	53	53	49	59	65	671	13	.....	3	5
Total.....	110	107	129	117	120	94	109	126	107	107	91	113	114	1337	11 pairs	.....	13	12
Welland:																		
Males.....	42	30	31	29	21	29	37	33	47	27	27	35	32	333	4	.....	2	1
Females.....	35	19	31	26	18	24	26	24	43	43	29	39	24	338	8	.....	3	1
Total.....	77	49	62	55	39	53	63	57	90	56	56	74	56	731	6 pairs	.....	5	2
Wellington:																		
Males.....	54	59	78	60	66	56	60	66	54	58	58	61	48	720	15	.....	3	10
Females.....	45	50	51	59	49	63	56	57	59	49	49	42	48	628	19	.....	6	6
Total.....	99	109	129	119	115	119	116	123	113	107	107	103	96	1348	17 pairs	.....	9	16
Wentworth:																		
Males.....	80	92	86	80	75	76	86	82	98	100	100	66	102	1023	9	.....	37	6
Females.....	83	61	71	67	66	68	76	69	78	73	73	81	75	868	11	.....	20	3
Total.....	163	153	157	147	141	144	162	151	176	173	173	147	177	1891	10 pairs	.....	57	9
York:																		
Males.....	174	171	248	195	210	211	230	259	240	197	197	212	255	2582	71	1	106	11
Females.....	181	170	231	203	209	179	194	246	196	209	209	219	226	2463	48	2	95	11
Total.....	355	341	479	398	419	390	424	505	436	406	406	431	461	5045	61 pairs	1 case	201	22
Total Males.....	2092	1888	2213	2102	2030	1878	1993	2095	2033	1943	1943	1800	1974	24071	380	4	338	126
“ Females.....	1831	1818	2019	1932	1837	1839	1813	1964	1930	1835	1835	1717	1762	22387	370	5	333	107
Grand Totals.....	3923	3736	4232	4034	3867	3717	3836	4059	3963	3778	3778	3517	3736	46458	375 pairs	3 cases	671	233

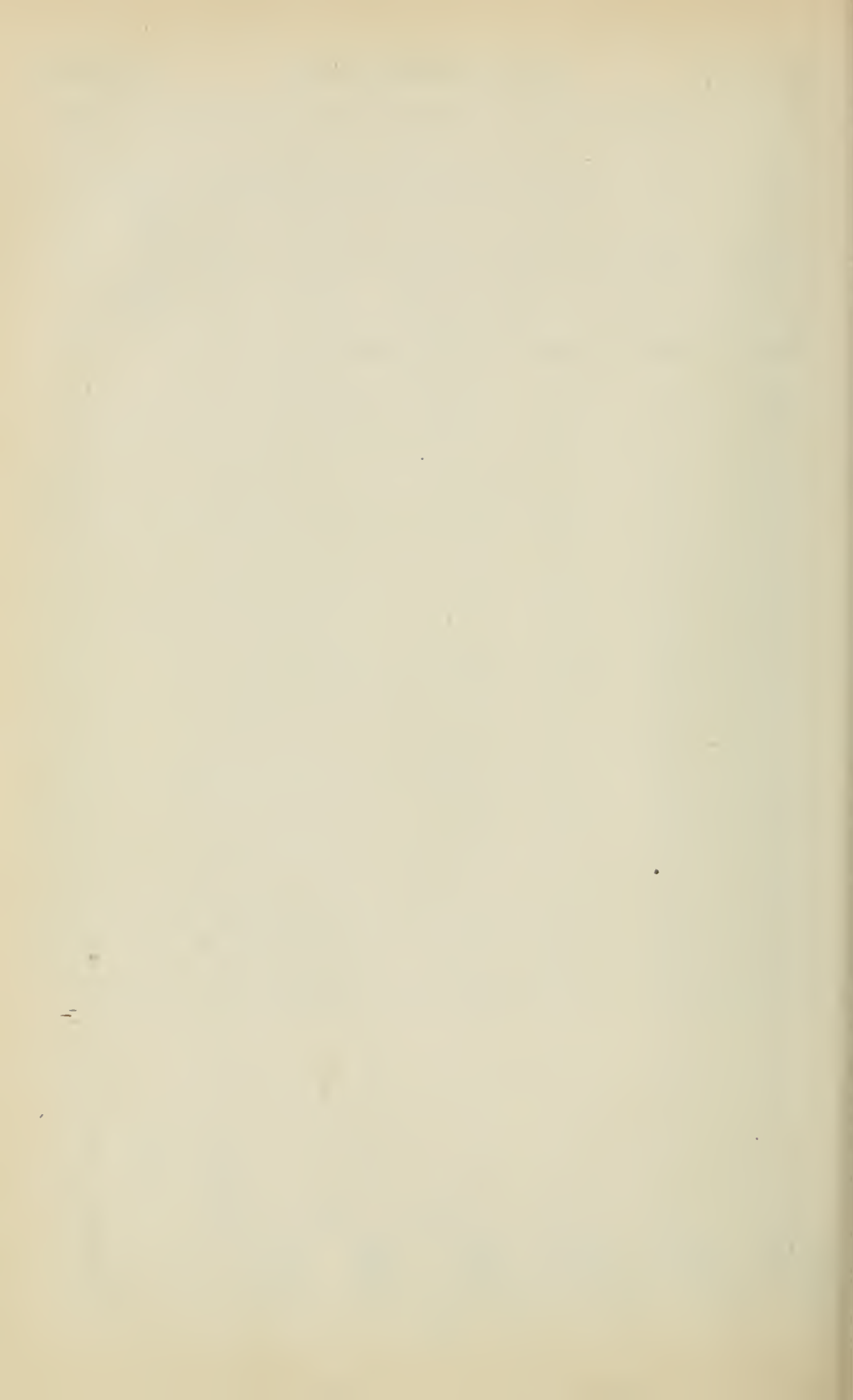
H. S. GREWE,  
Inspector.

TABLE A.—BIRTHS BY MONTHS—1886—CITIES.

CITIES.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	No. of Pairs of Twins.	Triplets.	Illegitimate.	Still Born.
<b>Toronto:</b>																	
Males.....	113	102	168	130	144	141	169	164	184	135	138	164	1752	52	1	103	10
Females.....	113	110	163	139	143	126	142	172	139	144	150	169	1710	38	2	92	4
Total.....	226	212	331	269	287	267	311	336	323	279	288	333	3462	45 pairs,	1 case,	195	14
<b>Hamilton:</b>																	
Males.....	43	57	55	49	39	50	57	50	60	53	40	69	622	4	.....	29	3
Females.....	44	33	41	38	37	44	52	40	42	50	45	40	506	6	.....	16	4
Total.....	87	90	96	87	76	94	109	90	102	103	85	109	1128	5 pairs,	.....	45	7
<b>Ottawa:</b>																	
Males.....	88	77	85	79	92	63	90	81	63	70	61	74	923	8	.....	23	1
Females.....	69	85	80	58	70	77	57	74	52	59	52	69	802	6	.....	39	.....
Total.....	157	162	165	137	162	140	147	155	115	129	113	143	1725	7 pairs,	.....	62	1
<b>London:</b>																	
Males.....	17	20	24	19	21	23	26	25	20	27	19	25	266	3	.....	10	7
Females.....	27	21	20	18	24	18	33	15	15	18	26	23	258	1	.....	6	6
Total.....	44	41	44	37	45	41	59	40	35	45	45	48	524	2 pairs,	.....	16	13
<b>St. Catharines:</b>																	
Males.....	6	8	7	8	8	8	12	8	11	5	6	6	93	3	.....	2	3
Females.....	6	10	6	13	3	9	6	11	9	4	10	2	89	3	.....	2	1
Total.....	12	18	13	21	11	17	18	19	20	9	16	8	182	3 pairs,	.....	4	4
<b>Kingston:</b>																	
Males.....	14	13	10	12	5	17	9	10	15	10	18	2	135	3	.....	.....	.....
Females.....	13	8	8	10	11	8	8	14	16	17	17	4	134	3	.....	.....	1
Total.....	27	21	18	22	16	25	17	24	31	27	35	6	269	2 pairs,	.....	.....	1

Belleville:	7	8	8	10	10	7	9	6	9	6	11	7	101	2	1	.....
Males.....	2	6	12	6	13	12	6	15	6	6	8	10	102	2	2	.....
Females.....																
Total.....	9	14	20	16	23	19	15	21	15	12	22	17	203	2 pairs.	3	1
Brantford:																
Males.....	17	19	12	14	13	9	19	14	12	17	10	6	162	4	7	2
Females.....	12	9	15	13	16	7	12	16	15	14	13	11	153	4	1	3
Total.....	29	28	27	27	29	16	31	30	27	31	23	17	315	4 pairs.	8	5
Guelph:																
Males.....	10	11	15	18	12	9	12	13	9	8	10	6	133	5	3	6
Females.....	7	7	8	12	15	12	9	12	13	10	5	7	117	1	3	3
Total.....	17	18	23	30	27	21	21	25	22	18	15	13	250	3 pairs.	6	9
St. Thomas:																
Males.....	13	10	13	15	3	16	15	13	10	12	12	15	147	4	.....	.....
Females.....	17	7	7	9	10	15	10	12	4	10	10	12	123	.....	1	1
Total.....	30	17	20	24	13	31	25	25	14	22	22	27	270	2 pairs.	1	1
Stratford:																
Males.....	5	6	9	6	10	3	10	8	16	9	12	8	102	1	.....	1
Females.....	5	6	8	5	4	10	13	10	7	15	7	8	98	1	.....	2
Total.....	10	12	17	11	14	13	23	18	23	24	19	16	200	1 pair.	.....	3
Total Males.....	333	331	406	360	357	346	428	392	409	352	340	382	4436	89	1	178
.. Females.....	315	302	368	321	346	338	348	391	318	347	313	355	4092	65	2	162
Grand Totals.....	648	633	774	681	703	684	776	783	727	699	653	737	8528	77 pairs.	1 case.	340

H. S. CREWE,  
*Inspector.*



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## MARRIAGES.

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TABLE B.—MARRIAGES BY DENOMINATIONS, 1886.

The following Table shows the number of Marriages returned as having been solemnized during the year 1886, the religious denomination of the parties married, and whether by license or banns.

COUNTIES.	RELIGIOUS DENOMINATION OF BRIDE AND BRIDEGROOM.												HOW MARRIED.			Total.	Total Marriages.	Widowers.	Widows.	
	Episcopalian.	Presbyterian.	Methodist.	Roman Catholic.	Baptist.	Congregationalist.	Lutheran.	Evangelical Association.	Quaker.	Mennonite.	Other denominations.	No denomination given.	Total.	Licenses.	Banns.					Not Stated.
ALTA.	28	36	35	33	1	.....	4	.....	.....	.....	1	4	142	.....	.....	.....	.....	.....	.....	.....
	20	36	36	35	3	1	6	.....	.....	.....	1	4	142	.....	.....	.....	.....	.....	.....	.....
	48	72	71	68	4	1	10	.....	.....	.....	2	8	284	121	18	3	142	11	12	.....
BRANT.	33	36	84	25	51	11	3	.....	.....	.....	2	.....	245	.....	.....	.....	.....	.....	.....	.....
	37	26	97	25	44	12	2	.....	.....	.....	2	.....	245	.....	.....	.....	.....	.....	.....	.....
	70	62	181	50	95	23	5	.....	.....	.....	4	.....	490	226	15	4	245	30	16	.....
BRUCE.	29	128	116	34	19	4	7	9	.....	2	5	.....	353	.....	.....	.....	.....	.....	.....	.....
	27	141	107	31	19	4	5	14	.....	1	4	.....	353	.....	.....	.....	.....	.....	.....	.....
	56	269	223	65	38	8	12	23	.....	3	9	.....	706	313	38	2	353	30	10	.....
CARLETON.	138	93	115	223	10	4	21	.....	.....	.....	.....	2	606	.....	.....	.....	.....	.....	.....	.....
	123	100	115	231	11	1	22	.....	.....	.....	.....	3	606	.....	.....	.....	.....	.....	.....	.....
	261	193	230	454	21	5	43	.....	.....	.....	.....	5	1212	426	173	7	606	82	36	.....

Dufferin :	36	61	76	.....	2	.....	1	.....	176	.....	.....	.....
Males .....	35	53	82	3	2	1	.....	.....	176	.....	.....	.....
Females .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total .....	71	110	158	3	4	1	1	.....	352	.....	176	5
Elgin :	42	47	131	16	19	.....	2	.....	1	294	.....	.....
Males .....	36	39	138	26	46	3	2	.....	1	294	.....	.....
Females .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total .....	78	86	269	42	95	7	4	.....	2	588	294	15
Essex :	40	31	111	138	15	.....	3	.....	3	376	.....	.....
Males .....	47	22	142	139	17	2	4	.....	3	376	.....	.....
Females .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total .....	87	53	286	277	32	4	7	.....	6	752	376	20
Frontenac :	68	52	107	51	5	10	1	.....	294	.....	.....	.....
Males .....	67	40	127	47	5	7	1	.....	294	.....	.....	.....
Females .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total .....	135	92	234	98	10	17	2	.....	588	267	294	11
Grey :	60	142	188	9	26	5	33	4	470	.....	.....	.....
Males .....	59	139	198	9	23	2	29	2	470	.....	.....	.....
Females .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total .....	119	281	386	18	49	7	62	9	940	448	470	12
Haldimand :	27	27	88	6	14	.....	6	6	3	177	.....	.....
Males .....	21	17	91	9	23	.....	6	7	3	177	.....	.....
Females .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total .....	48	44	179	15	37	.....	12	13	6	354	177	7
Halton :	23	24	57	2	3	.....	2	.....	113	.....	.....	.....
Males .....	21	21	60	2	3	.....	2	.....	113	.....	.....	.....
Females .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total .....	44	48	117	4	6	4	2	.....	226	111	113	3

TABLE B.—MARRIAGES BY DENOMINATIONS, 1886.—*Continued.*

COUNTIES.	RELIGIOUS DENOMINATION OF BRIDE AND BRIDEGROOM.												HOW MARRIED.						
	Episcopalian.	Presbyterian.	Methodist.	Roman Catholic.	Baptist.	Congregationalist.	Lutheran.	Evangelical Association.	Quaker.	Memorite.	Other Denominations.	No Denomination given.	Total.	License.	Banns.	Not Stated.	Total Marriages.	Widowers.	Widows.
Haliburton :	2	7	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	28	.....	.....	.....	.....	.....	.....
	4	5	18	.....	1	.....	.....	.....	.....	.....	.....	.....	28	.....	.....	.....	.....	.....	.....
	6	12	37	.....	1	.....	.....	.....	.....	.....	.....	.....	56	28	.....	.....	28	2	3
Total .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hastings :	56	47	257	55	12	4	.....	.....	.....	.....	.....	.....	431	.....	.....	.....	.....	.....	.....
	44	54	269	57	5	2	.....	.....	.....	.....	.....	.....	431	.....	.....	.....	.....	.....	.....
	100	101	526	112	17	6	.....	.....	.....	.....	.....	.....	862	380	51	.....	431	63	21
Total .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Huron :	60	152	187	23	7	1	9	16	.....	4	.....	2	461	.....	.....	.....	.....	.....	.....
	53	153	190	25	7	2	9	15	.....	5	.....	2	461	.....	.....	.....	.....	.....	.....
	113	305	377	48	14	3	18	31	.....	9	.....	4	922	442	18	1	461	51	12
Total .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kent :	54	82	166	47	27	.....	1	.....	.....	.....	.....	.....	386	.....	.....	.....	.....	.....	.....
	40	83	185	49	23	.....	.....	.....	.....	.....	.....	.....	386	.....	.....	.....	.....	.....	.....
	94	165	351	96	50	.....	1	.....	.....	.....	.....	.....	772	363	21	2	386	47	19
Total .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....







[illegible]



TABLE B.—MARRIAGES BY DENOMINATIONS, 1886.—Continued.

COUNTIES.	RELIGIOUS DENOMINATION OF BRIDE AND BRIDEGROOM.												HOW MARRIED.				Total.	Total Marriages.	Widowers.	Widows.		
	Episcopalian.	Presbyterian.	Methodist.	Roman Catholic.	Baptist.	Congregationalist.	Lutheran.	Evangelical Association.	Quaker.	Mennonite.	Other Denominations.	No Denomination given.	License.	Banns.	Not Stated.							
Stormont, Dundas and Glengarry: Males..... Females..... Total .....	37	90	97	135	9	3	5	.....	.....	1	.....	1	378	.....	.....	.....	.....	.....	.....	.....	.....	.....
	36	95	97	133	7	.....	7	.....	.....	2	.....	1	378	.....	.....	.....	.....	.....	.....	.....	.....	
	73	185	194	268	16	3	12	.....	.....	3	.....	2	756	252	124	2	378	.....	.....	.....	.....	
Victoria: Males..... Females..... Total .....	32	41	84	28	3	1	.....	.....	1	.....	4	.....	194	.....	.....	.....	.....	.....	.....	.....	.....	
	24	51	80	28	8	.....	.....	.....	.....	.....	3	.....	194	.....	.....	.....	.....	.....	.....	.....	.....	
	56	92	164	56	11	1	.....	.....	1	.....	7	.....	388	170	24	.....	194	.....	.....	.....	.....	
Waterloo: Males..... Females..... Total .....	19	84	81	59	10	3	53	18	.....	39	5	10	381	.....	.....	.....	.....	.....	.....	.....	.....	
	20	79	85	65	14	1	50	19	.....	36	4	8	381	.....	.....	.....	.....	.....	.....	.....	.....	
	39	163	166	124	24	4	103	37	.....	75	9	18	762	264	116	1	381	.....	.....	.....	.....	
Welland: Males..... Females..... Total .....	34	29	73	18	9	.....	11	.....	2	1	14	6	197	.....	.....	.....	.....	.....	.....	.....	.....	
	36	22	87	22	4	.....	9	.....	1	1	13	2	197	.....	.....	.....	.....	.....	.....	.....	.....	
	70	51	160	40	13	.....	20	.....	3	2	27	8	394	184	12	1	197	.....	.....	.....	.....	





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## TABLE C.

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### MARRIAGES BY MONTHS.

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TABLE C.—MARRIAGES BY MONTHS, 1886.

COUNTIES.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	No Date given.	Total Number of Couples Married.
Algoma and Thunder Bay.....	8	19	8	10	7	21	9	7	10	16	10	16	1	142
Brant.....	23	24	14	14	14	24	11	14	26	25	29	27	.....	245
Bruce.....	26	36	36	24	24	23	24	15	31	27	31	35	1	333
Carleton.....	48	39	46	34	50	66	51	46	56	53	69	45	3	606
Chatham.....	26	14	27	11	9	17	8	3	7	18	12	24	.....	176
Dufferin.....	24	16	35	22	19	17	16	18	32	24	36	35	.....	294
Elgin.....	32	29	37	15	36	28	20	21	34	50	38	35	1	376
Essex.....	21	14	22	20	16	29	26	22	36	22	34	28	4	294
Frontenac.....	42	46	41	26	29	29	22	24	40	43	51	76	1	470
Halifax.....	19	12	13	19	18	14	4	4	10	16	14	34	.....	177
Haldimand.....	13	8	13	8	6	7	7	3	9	16	6	17	.....	113
Haliburton.....	.....	3	4	3	3	1	4	2	2	2	2	2	.....	28
Hastings.....	42	24	38	32	25	38	29	27	38	44	46	48	.....	431
Huron.....	36	42	57	30	33	43	23	17	30	46	33	70	1	461
Kent.....	28	21	26	20	32	25	17	15	32	46	43	78	3	386
Lambton.....	24	26	28	19	14	28	20	15	24	34	36	51	.....	319
Lanark.....	22	15	24	17	17	23	15	19	30	17	28	43	.....	270
Leeds and Grenville.....	35	22	35	36	24	35	16	17	21	39	35	46	.....	361

Lennox and Addington .....	18	24	24	13	9	17	9	15	22	18	16	27	.....	212
Lincoln .....	15	18	9	11	10	13	15	11	17	21	23	29	2	191
Middlesex .....	52	58	62	37	48	68	37	33	61	78	57	76	1	638
Muskoka and Parry Sound .....	12	11	23	25	15	14	21	18	26	21	16	21	2	225
Norfolk .....	18	19	16	19	16	6	7	15	14	17	24	34	1	206
Northumberland and Durham .....	43	51	62	28	26	49	32	22	40	30	51	82	.....	516
Ontario .....	24	26	34	12	9	13	14	13	26	29	16	49	1	266
Oxford .....	31	33	58	25	23	25	23	17	30	27	25	43	.....	330
Ped .....	16	15	14	9	4	10	5	6	10	7	14	27	.....	137
Perth .....	34	23	32	22	34	26	17	20	23	31	31	45	1	339
Peterborough .....	26	14	34	20	16	25	9	10	23	22	19	23	.....	241
Prescott and Russell .....	18	17	23	9	10	15	26	18	32	36	27	7	.....	238
Prince Edward .....	10	15	15	8	3	8	4	8	20	6	10	16	2	125
Renfrew .....	16	11	37	18	25	29	14	19	27	22	23	21	2	264
Simcoe .....	36	33	59	31	38	36	35	18	47	60	45	75	4	517
Stormont, Dundas and Glengarry .....	28	38	51	15	22	40	21	25	37	36	33	29	3	378
Victoria .....	13	14	21	11	12	24	15	11	19	18	20	16	.....	194
Waterloo .....	40	30	36	25	24	36	15	23	34	38	34	46	.....	381
Welland .....	14	15	17	10	12	11	9	16	30	25	18	20	.....	197
Wellington .....	46	38	34	26	22	65	22	10	25	39	33	60	1	391
Wentworth .....	29	43	47	36	36	67	40	38	62	43	49	61	.....	551
York .....	110	112	130	124	113	153	118	160	193	180	168	180	2	1743
Totals .....	1118	1068	1342	894	903	1188	830	815	1286	1342	1305	1717	37	13845

H. S. CREWE,  
*Inspector.*



TABLE D.—MARRIAGES BY AGES, 1886.

COUNTIES.	Under 20.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and under 45.	45 and under 50.	50 and under 55.	55 and under 60.	60 and under 65.	65 and under 70.	70 and under 75.	75 and under 80.	Over 80.	Ages not given.	Total.
Algonia and Thunder Bay :																
	Males .....	17	51	19	8	1	4	1	2	.....	1	.....	.....	.....	2	142
	Females .....	31	26	9	3	1	2	.....	.....	.....	.....	.....	.....	.....	9	142
Total .....	31	108	77	28	11	2	6	1	2	.....	1	.....	.....	.....	17	284
Brant :																
	Males .....	4	83	30	14	9	4	4	2	2	.....	2	.....	.....	.....	245
	Females .....	48	108	51	7	4	3	3	1	.....	1	1	.....	.....	1	245
Total .....	52	191	142	47	21	13	7	7	3	2	1	3	.....	.....	1	490
Bruce :																
	Males .....	3	113	53	10	10	.....	2	2	3	1	.....	.....	.....	.....	353
	Females .....	67	184	75	4	5	.....	.....	.....	1	.....	1	.....	.....	1	353
Total .....	70	297	231	68	14	15	.....	2	2	4	1	1	.....	.....	1	706
Carleton :																
	Males .....	10	211	99	29	20	14	5	5	2	4	1	.....	.....	3	606
	Females .....	90	302	132	16	17	3	.....	.....	2	.....	.....	.....	.....	4	606
Total .....	100	513	335	139	45	37	17	5	5	4	4	1	.....	.....	7	1212
Dufferin :																
	Males .....	.....	57	77	7	3	3	4	.....	2	1	.....	.....	.....	1	176
	Females .....	29	99	35	3	1	.....	2	1	.....	.....	.....	.....	.....	.....	176
Total .....	29	156	112	27	10	4	3	6	1	2	1	.....	.....	.....	1	352
Elgin :																
	Males .....	4	97	109	18	9	5	3	2	3	3	.....	.....	.....	1	294
	Females .....	58	136	66	6	3	5	2	1	.....	1	.....	.....	.....	2	294
Total .....	62	233	175	54	24	12	10	5	3	3	4	.....	.....	.....	3	588

Barnes.	Males .....	8	133	115	44	24	46	4	7	2	1	1	1	1	376
	Females .....	98	169	71	16	11	3	2	2	2	2	.....	.....	.....	376
	Total .....	106	322	186	60	35	19	6	9	4	3	1	.....	.....	752
Frontenac :															
Frontenac.	Males .....	4	97	117	35	17	9	6	3	2	4	.....	.....	.....	294
	Females .....	57	140	65	17	8	3	4	2	.....	.....	.....	.....	1	294
	Total .....	61	237	182	52	25	12	7	5	2	1	.....	.....	1	588
Grey :															
Grey.	Males .....	1	161	135	63	22	9	9	2	.....	.....	1	.....	.....	470
	Females .....	88	249	103	20	6	2	1	1	.....	.....	.....	.....	.....	470
	Total .....	89	413	296	89	28	11	10	3	.....	.....	1	.....	.....	940
Haldimand :															
Haldimand.	Males .....	7	74	56	20	7	3	2	2	2	2	1	1	.....	177
	Females .....	40	92	26	6	7	2	2	.....	.....	.....	.....	.....	.....	177
	Total .....	47	166	82	26	14	5	4	2	1	2	1	1	.....	354
Hastings :															
Hastings.	Males .....	1	29	51	14	8	5	1	2	1	1	.....	.....	.....	113
	Females .....	14	39	25	3	4	4	2	.....	.....	.....	.....	.....	.....	113
	Total .....	15	88	78	17	12	9	3	2	1	1	.....	.....	.....	226
Hatherton :															
Hatherton.	Males .....	.....	17	8	.....	2	.....	.....	.....	.....	.....	1	.....	.....	28
	Females .....	11	12	2	1	.....	1	.....	.....	.....	.....	1	.....	.....	28
	Total .....	11	29	10	1	2	1	.....	.....	.....	.....	2	.....	.....	56
Hastings :															
Hastings.	Males .....	5	166	144	57	21	13	11	5	6	1	1	1	.....	431
	Females .....	91	191	95	25	14	7	4	.....	2	.....	.....	.....	2	431
	Total .....	96	357	239	82	35	20	15	5	8	1	1	1	.....	862
Huron :															
Huron.	Males .....	2	137	178	83	26	11	7	6	4	4	1	1	.....	461
	Females .....	58	253	112	20	7	3	4	1	2	1	.....	.....	.....	461
	Total .....	60	390	290	103	33	14	11	7	6	5	1	1	.....	922



[illegible]

TABLE D.—MARRIAGES BY AGES, 1886.—Continued.

COUNTIES.	Under 20.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and under 45.	45 and under 50.	50 and under 55.	55 and under 60.	60 and under 65.	65 and under 70.	70 and under 75.	75 and under 80.	Over 80.	Ages not given.	Total.
Peterborough:																
Males .....	2	72	102	34	15	6	4	4	1	.....	.....	.....	.....	.....	1	241
Females .....	36	117	62	10	5	5	2	2	.....	1	.....	.....	.....	.....	1	241
Total .....	38	189	164	44	20	11	6	6	1	1	.....	.....	.....	.....	2	482
Prescott and Russell:																
Males .....	2	116	73	18	7	9	6	2	.....	3	.....	.....	.....	.....	2	238
Females .....	57	122	36	7	5	7	1	.....	.....	1	.....	.....	.....	.....	2	238
Total .....	59	238	109	25	12	16	7	2	.....	4	.....	.....	.....	.....	4	476
Prince Edward:																
Males .....	1	63	32	12	5	1	3	.....	4	2	1	.....	1	.....	.....	125
Females .....	30	63	10	4	7	3	3	.....	2	2	.....	.....	.....	.....	1	125
Total .....	31	126	42	16	12	4	6	.....	6	4	1	.....	1	.....	1	250
Renfrew:																
Males .....	3	87	100	36	21	9	5	1	1	1	.....	.....	.....	.....	.....	264
Females .....	66	111	60	15	6	1	3	.....	1	.....	.....	.....	.....	.....	1	264
Total .....	69	198	160	51	27	10	8	1	2	1	.....	.....	.....	.....	1	528
Simcoe:																
Males .....	4	180	212	50	39	16	4	4	4	3	1	.....	.....	.....	.....	517
Females .....	113	253	102	25	13	3	4	1	.....	2	.....	.....	.....	.....	1	517
Total .....	117	433	314	75	52	19	8	5	4	5	1	.....	.....	.....	1	1034
Stormont, Dundas and Glengarry:																
Males .....	6	145	116	46	29	11	6	4	6	2	.....	.....	.....	.....	7	378
Females .....	61	188	74	27	13	4	2	1	.....	.....	.....	.....	.....	.....	8	378
Total .....	67	333	190	73	42	15	8	5	6	2	.....	.....	.....	.....	15	756

[illegible]

H. S. CREWE,  
*Inspector.*





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## DEATHS.

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TABLE E.—

Distinguishing by Months, by Ages, by Sex and by Diseases, the Registered Number

CAUSE OF DEATH.	MONTHS.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
CLASS I. ZYMOTIC DISEASES.													
ORDER I. Miasmatic Diseases. <i>Miasmatici</i> .													
Anthrax (Carbuncle).....M			1				2				1		4
.....F													
Total.....			1				2				1		4
Cholera Infantum.....M	4	2	4	2	7	5	41	91	81	18	5	4	264
.....F	1	3	2	2	2	5	38	80	46	15	2	5	201
Total.....	5	5	6	4	9	10	79	171	127	33	7	9	465
Cholera Morbus.....M	1						2	3	9	5		1	21
.....F						1		3	1	4			9
Total.....	1					1	2	6	10	9		1	30
CynancheTrachealis(MembranousCroup)M	20	30	18	10	14	18	11	14	14	30	25	22	226
.....F	18	20	17	19	20	7	8	4	11	24	25	28	201
Total.....	38	50	35	29	34	25	19	18	25	54	50	50	427
Diarrhœa Acuta (Acute Diarrhœa).....M	2	5	5	2	7	8	52	85	82	28	6	4	286
.....F	6	3	4	9	3	8	34	70	82	28	7	5	259
Total.....	8	8	9	11	10	16	86	155	164	56	13	9	545
Diarrhœa Chronica (Chronic Diarrhœa).M			1				2	9	12	3	2	1	30
.....F			4	3	3		2	4	3	6	2	1	28
Total.....			5	3	3		4	13	15	9	4	2	58
Dysentery.....M	2	2	1	1	1	5	9	9	12	4	2	3	51
.....F		1	1	1	1	2	11	11	23	10		1	62
Total.....	2	3	2	2	2	7	20	20	35	14	2	4	113
Diphtheria.....M	74	62	62	63	41	37	29	47	70	79	66	74	704
.....F	96	69	74	43	45	26	35	47	43	72	67	85	702
Total.....	170	131	136	106	86	63	64	94	113	151	133	159	1406
Erysipelas.....M	12	9	6	8	6	3	1	4	1	4	7	6	67
.....F	5	4	9	3	3	3	2		1	2	2	1	35
Total.....	17	13	15	11	9	6	3	4	2	6	9	7	102

DEATHS.

of Deaths from various specified causes (arranged in Classes) during the year 1886.

SEX.	AGES.														
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.	Total.
Males .....						1	1	1			1				4
Females .....															
Total .....						1	1	1			1				4
Males .....	209	53	2												264
Females .....	161	39	1												201
Total .....	370	92	3												465
Males .....							3	3	5	5	3	2			21
Females .....	1			1		1		1	1	2	1	1			9
Total .....	1			1		1	3	4	6	7	4	3			30
Males .....	41	129	47	8										1	226
Females .....	44	123	27	7											201
Total .....	85	252	74	15										1	427
Males .....	211	52	2	2	1		1	2	3	1	5	1		5	286
Females .....	180	49	3			4	4	1	3	2	5	3		5	259
Total .....	391	101	5	2	1	4	5	3	6	3	10	4		10	545
Males .....							2	1	3	3	15	6			30
Females .....						3	1	2	3	3	7	7	1	1	28
Total .....						3	3	3	6	6	22	13	1	1	58
Males .....	18	15				1			2	3	9	2		1	51
Females .....	20	9			2		6	2	1	5	5	3	1	8	62
Total .....	38	24			2	1	6	2	3	8	14	5	1	9	113
Males .....	59	308	224	67	28	6	3	2	1					6	704
Females .....	37	272	246	80	29	14	5	1	2	4				12	702
Total .....	96	580	470	147	57	20	8	3	3	4				18	1406
Males .....	17	4	6			5	5	4	3	10	10	2		1	67
Females .....	14	2		2		4	2	2	2	4	2			1	35
Total .....	31	6	6	2		9	7	6	5	14	12	2		2	102

TABLE E.—

CAUSE OF DEATH.	MONTHS.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Febris Biliosa (Bilious Fever).....M	1	2	....	1	1	....	....	....	2	1	....	1	9
.....F	....	1	1	1	....	....	....	1	....	2	....	....	6
Total....	1	3	1	2	1	....	....	1	2	3	....	1	15
Febris Cerebro-Spinalis (Spinal Fever).....M	3	4	12	4	4	4	4	1	8	3	4	6	57
.....F	4	4	6	5	4	3	6	5	5	8	5	6	61
Total.....	7	8	18	9	8	7	10	6	13	11	9	12	118
Febris Congestiva (Congestive Fever).....M	..	1	1	1	....	....	....	....	....	....	....	....	3
.....F	1	....	1	....	....	....	....	....	....	....	....	....	2
Total.....	1	1	2	1	....	....	....	....	....	....	....	....	5
Febris Intermittent (Intermittent Fever).....M	....	....	4	3	2	4	1	1	2	3	2	1	23
.....F	4	3	5	5	2	....	1	2	3	2	4	4	35
Total.....	4	3	9	8	4	4	2	3	5	5	6	5	58
Febris Remittens (Remittent Fever).....M	....	....	....	....	....	1	1	1	1	1	....	2	7
.....F	....	....	4	1	....	1	3	....	....	1	1	1	12
Total.....	....	....	4	1	....	2	4	1	1	2	1	3	19
Febris Typhoides (Typhoid Fever).....M	23	11	19	17	12	4	9	14	42	39	23	18	221
.....F	11	14	10	10	13	9	4	15	19	31	20	9	165
Total.....	24	25	29	27	25	13	13	29	61	70	43	27	386
Influenza.....M	4	2	3	....	1	....	....	1	....	2	....	2	15
.....F	5	4	5	....	1	....	1	....	....	....	2	2	20
Total.....	9	6	8	....	2	....	1	1	....	2	2	4	35
Morbilli (Measles).....M	6	5	6	19	20	2	3	....	2	6	5	1	75
.....F	5	4	9	13	13	2	9	4	2	5	6	2	74
Total.....	11	9	15	32	33	4	12	4	4	11	11	3	149
Parotitis (Mumps).....M	....	1	....	....	....	1	1	....	....	....	....	....	3
.....F	....	....	....	....	....	....	....	....	....	....	....	....	....
Total.....	....	1	....	....	....	1	1	....	....	....	....	....	3
Pertussis (Whooping Cough).....M	7	3	6	8	3	9	3	15	11	10	7	6	88
.....F	8	7	15	12	12	5	8	14	12	8	9	7	117
Total.....	15	10	21	20	15	14	11	29	23	18	16	13	205

DEATHS.—Continued.

SEX.	AGES.												
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.
Males.....					1	2	1	1	2	1		1	...
Females.....			1				1		1	2			1
Total.....			1		1	2	2	1	3	3		1	1
Males.....	18	18	8	2	4	2	1	2	1				1
Females.....	16	21	8	4	5	3	2						2
Total.....	34	39	16	6	9	5	3	2	1				3
Males.....	2					1							
Females.....	1												1
Total.....	3					1							1
Males.....		8	3	2	3	3	2			1			1
Females.....	3	8	7	1	3	5	3	1	1	2	1		
Total.....	3	16	10	3	6	8	5	1	1	3	1		1
Males.....		2	1				1			2			1
Females.....		4				1	1	1		1	2		2
Total.....		6	1			1	2	1		3	2		3
Males.....	2	9	9	15	27	60	31	25	15	11	4	1	12
Females.....	4	7	7	15	28	41	27	10	12	6			8
Total.....	6	16	16	30	55	101	58	35	27	17	4	1	20
Males.....	10	2						1		2			
Females.....	7	5	1	1		1				2	2		1
Total.....	17	7	1	1		1		1		4	2		1
Males.....	21	39	9	2	1	1							2
Females.....	15	52	1	1		3		1					1
Total.....	36	91	10	3	1	4		1					3
Males.....	1		1			1							
Females.....													
Total.....	1		1			1							
Males.....	62	24	2										
Females.....	78	33	6										
Total.....	140	57	8										



TABLE E.—

CAUSE OF DEATH.	MONTHS.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Pyæmia.....M	3	6	4	1	5	1	2	2	2	6	6	1	39
“.....F	2	4	5	5	3	4	1	5	6	2	6	7	50
Total.....	5	10	9	6	8	5	3	7	8	8	12	8	89
Scarlatina (Scarlet Fever).....M	20	20	22	7	15	9	6	9	5	3	9	6	131
“.....F	14	14	24	14	12	10	6	6	3	7	8	11	129
Total.....	34	34	46	21	27	19	12	15	8	10	17	17	260
Tonsilitis (Quinsy).....M	3	...	1	1	...	1	1	...	...	1	3	5	16
“.....F	1	...	1	2	...	...	...	...	1	...	1	...	6
Total.....	4	...	2	3	...	1	1	...	1	1	4	5	22
Variola (Small-Pox).....M	3	...	2	...	...	1	...	...	...	...	1	1	8
“.....F	4	2	5	...	...	...	...	...	...	...	...	...	11
Total.....	7	2	7	...	...	1	...	...	...	...	1	1	19
ORDER 2. ENTHETIC DISEASE. <i>Enthetici.</i>													
Syphilis.....M	...	...	...	1	2	1	...	1	1	...	...	1	7
“.....F	1	...	...	1	1	...	2	...	1	...	1	...	7
Total.....	1	...	...	2	3	1	2	1	2	...	1	1	14
ORDER 3. DIETIC DISEASES. <i>Dictici.</i>													
Alcoholism.....M	2	...	1	2	1	3	2	4	1	...	...	...	16
“.....F	...	...	...	...	...	...	...	...	...	...	1	...	1
Total.....	2	...	1	2	1	3	2	4	1	...	1	...	17
Bronchocele (Goitre).....M	...	...	...	...	...	...	...	...	...	2	...	...	2
“.....F	...	2	...	...	...	2	...	...	1	1	...	...	6
Total.....	...	2	...	...	...	2	...	...	1	3	...	...	8
Rachitis.....M	...	...	...	...	1	...	...	...	...	...	...	...	1
“.....F	...	...	...	...	...	...	...	...	...	...	...	...	...
Total.....	...	...	...	...	1	...	...	...	...	...	...	...	1
utis (Scurvy).....M	...	...	...	...	...	...	...	...	...	1	...	...	1
“.....F	...	...	...	...	...	...	...	1	...	...	...	...	1
Total.....	...	...	...	...	...	...	...	1	...	1	...	...	2

DEATHS.—Continued.

SEX.	AGES.														Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.	
Males .....	3	...	1	2	4	4	2	3	8	5	5	...	...	2	39
Females .....	6	2	3	1	3	15	10	2	2	3	...	...	...	3	50
Total .....	9	2	4	3	7	19	12	5	10	8	5	...	...	5	89
Males .....	15	80	19	10	2	...	...	1	1	...	...	...	...	3	131
Females .....	15	67	31	10	1	4	...	...	...	...	...	...	...	1	129
Total .....	30	147	50	20	3	4	...	1	1	...	...	...	...	4	260
Males .....	2	5	3	...	1	2	1	1	...	...	1	...	...	...	16
Females .....	2	1	2	...	...	...	1	...	...	...	...	...	...	...	6
Total .....	4	6	5	...	1	2	2	1	...	...	1	...	...	...	22
Males .....	...	1	2	1	1	3	...	...	...	...	...	...	...	...	8
Females .....	1	2	...	1	2	3	...	...	...	...	...	...	...	2	11
Total .....	1	3	2	2	3	6	...	...	...	...	...	...	...	2	19
Males .....	3	...	...	...	1	...	1	2	...	...	...	...	...	...	7
Females .....	2	...	...	...	...	1	1	...	1	...	...	...	...	2	7
Total .....	5	...	...	...	1	1	2	2	1	...	...	...	...	2	14
Males .....	...	...	...	...	...	...	3	7	3	2	1	...	...	...	16
Females .....	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1
Total .....	...	...	...	...	...	...	3	7	4	2	1	...	...	...	17
Males .....	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Females .....	...	...	...	1	...	1	1	1	...	1	...	1	...	...	6
Total .....	2	...	...	1	...	1	1	1	...	1	...	1	...	...	8
Males .....	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1
Females .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total .....	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1
Males .....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Females .....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Total .....	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2

TABLE E.—

CAUSE OF DEATH.	MONTHS.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
ORDER 4. PARASITIC DISEASES. <i>Parasitici.</i>													
Apthæ (Thrush) . . . . .	M	3	2	2	1	1	...	4	...	2	2	...	17
“ “													

DEATHS.—*Continued.*

SEX.	AGES.														Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	99 and over.	Unknown.	
Males.....	14	3													17
Females.....	20	3													23
Total.....	34	6													40
Males.....	1	5	1			1				1					9
Females.....	1	12	2												15
Total.....	2	17	3			1				1					24
Males.....	712	758	340	111	74	93	58	56	47	47	54	15		36	2401
Females.....	629	711	346	125	73	104	65	25	30	37	25	15	2	51	2238
Grand Total..	1341	1469	686	236	147	197	123	81	77	84	79	30	2	87	4639
Males.....	703	92	3	7	2	4	5	10	15	27				5	873
Females.....	570	74	7	5	6	25	18	23	17	42				4	791
Total.....	1273	166	10	12	8	29	23	33	32	69				9	1664
Males.....	2	4	3	1	2	7	7	12	13	30	43	20	2	7	153
Females.....	5	3	5	4	5	17	11	19	23	42	42	19	2	8	205
Total.....	7	7	8	5	7	24	18	31	36	72	85	39	4	15	358
Males.....	1	2					5	2	7	10	22	7		1	57
Females.....	2	4				1		4	6	6	4	6		1	34
Total.....	3	6				1	5	6	13	16	26	13		2	91
Males.....					4	4	13	21	38	74	46	13		8	221
Females.....					2	4	22	31	45	61	35	13		6	219
Total.....					6	8	35	52	83	135	81	26		14	440
Males.....							1			2					3
Females.....				1					1						2
Total.....				1			1		1	2					5
Males.....	1							1		2	4	3			11
Females.....			1			1		2	1		1		1	2	9
Total.....	1		1			1		3	1	2	5	3	1	2	20

TABLE E.—

CAUSE OF DEATH.	MONTHS.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Noma (Canker).....M							2						2
“ “.....F				2			1		1		1		5
Total.....				2			3		1		1		7
Tabes Mesenterica.....M			2	1					2				5
“ “.....F			1			1	2		2				6
Total.....			3	1		1	2		4				11
Rheumatism.....M	5	7	8	9	10	6	8	7	3	4	4		71
“ “.....F	3	11	11	8	5	5	6	4	3	2	5	9	72
Total.....	8	18	19	17	15	11	14	11	3	5	9	13	143
ORDER 2. TUBERCULAR DISEASES. <i>Phthisici.</i>													
Hydrocephalus.....M	5	4	5	9	4	4	10	6	10	9	9	9	84
“ “.....F	6	6	6	3	5	2	4	5	6	5	3	2	53
Total.....	11	10	11	12	9	6	14	11	16	14	12	11	137
Tubercular Meningitis.....M	7	7	7	2	1	7	5	3	5	4	1	1	50
“ “.....F	9	7	3	3	4	5	6	4	7	6	1	4	59
Total.....	16	14	10	5	5	12	11	7	12	10	2	5	109
Scrofula.....M	2	1	1	1	1	....	1	1	1	2	1	....	12
“ “.....F	5	2	2	5	3	2	....	....	1	1	....	1	22
Total.....	7	3	3	6	4	2	1	1	2	3	1	1	34
Phthisis.....M	98	94	96	98	89	99	82	75	82	84	80	94	1071
“ “.....F	93	142	130	130	118	95	110	101	110	129	91	99	1348
Total.....	191	236	226	228	207	194	192	176	192	213	171	193	2419
Total Constitutional Diseases.....M	232	226	246	219	222	216	227	217	247	202	186	173	2613
“ “.....F	215	274	292	237	229	194	250	229	255	255	199	196	2825
Total.....	447	500	538	456	451	410	477	446	502	457	385	369	5438
CLASS III. LOCAL DISEASES.													
<i>Monorganici.</i>													
ORDER 1. DISEASES OF THE NERVOUS SYSTEM. <i>Cephalici.</i>													
Apoplexia (Apoplexy).....M	12	8	20	19	17	17	16	18	10	14	12	26	189
“ “.....F	10	13	19	12	11	12	12	14	10	14	16	13	156
Total.....	22	21	39	31	28	29	28	32	20	28	28	39	345



## DEATHS—Continued.

SEX.	AGES.													
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.
Males	2													
Females	5													
Total	7													
Males	3	2												
Females	1	1	1		1	2								
Total	4	3	1		1	2								
Males	1	2	5	8	4	7	5	7	4	11	9	4	1	3
Females	1	2	6	3	6	3	6	7	8	15	7	3	1	3
Total	2	4	11	11	10	10	11	14	12	26	16	7	2	7
Males	53	25	4			1								1
Females	33	15	4			1								
Total	86	40	8			2								1
Males	15	14	4	1	4	5	1	2	2					2
Females	16	21	4	4	4	1	3	2	1	1				2
Total	31	35	8	5	8	6	4	4	3	1				4
Males	9	2								1				
Females	21										1			
Total	30	2								1	1			
Males	34	23	9	6	70	366	206	120	105	67	36	4		25
Females	22	18	15	30	165	506	256	141	86	55	17	6		31
Total	56	41	24	36	235	872	462	261	191	122	53	10		56
Males	824	166	28	23	86	394	243	175	184	224	160	51	3	52
Females	676	138	43	47	189	561	316	229	188	222	107	47	4	58
Total	1500	304	71	70	275	955	559	404	372	446	267	98	7	110
Males						12	8	23	20	59	46	9	1	11
Females						7	12	16	32	32	33	13	1	10
Total						19	20	39	52	91	79	22	2	21





DEATHS.—*Continued.*

SEX.	AGES.												
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.
Males .....								1	2				
Females .....													
Total .....								1	2				
Males .....				1		1				1			
Females .....					2			1					
Total .....				1	2	1		1		1			
Males .....	282	54	2	2	6								
Females .....	189	64	9	1	13								
Total .....	471	118	11	3	19								
Males .....	52	42	17	6	3	10	7	8	8	5	3	1	4
Females .....	44	44	15	12	6	14	10	3	3	7	2	1	2
Total .....	96	86	32	18	9	24	17	11	11	12	5	2	6
Males .....						10	10	5	3	3	2	1	2
Females .....						19	7	5	2	5	1	1	40
Total .....						29	17	10	5	8	3	2	2
Males .....								2		1	5	1	9
Females .....						1		1			3	1	6
Total .....						1		3		1	8	2	15
Males .....													
Females .....								1		1			2
Total .....								1		1			2
Males .....					1	1	1	3	5		1		2
Females .....						1	3	2	3	2	2		1
Total .....					1	2	4	5	8	2	3		3
Males .....	39	34	8	3	6	7	7	6	5	7	2	1	2
Females .....	27	25	11	7	7	4	2	4	2	3	1		4
Total .....	66	59	19	10	13	11	9	10	7	10	3	1	6
Males .....		1		1			1		1	2			6
Females .....													
Total .....		1		1			1		1	2			6



DEATHS.—Continued.

SEX.	AGES.													Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	
Males .....	3	1	2	1	...	4	1	4	1	1	1	...	...	19
Females .....	2	...	1	1	3	3	1	...	...	1	1	...	...	15
Total .....	5	1	3	2	3	7	2	4	1	2	2	...	...	34
Males .....	...	...	2	...	1	...	1	5	4	4	7	4	...	30
Females .....	...	...	1	...	...	1	1	...	5	6	7	5	...	26
Total .....	...	...	3	...	1	1	2	5	9	10	14	9	...	56
Males .....	8	5	4	3	2	5	18	18	27	70	72	36	5	275
Females .....	3	3	4	2	2	4	5	22	31	70	50	31	1	232
Total .....	11	8	8	5	4	9	23	40	58	140	122	67	6	507
Males .....	...	1	1	...	...	1	1	1	...	...	...	...	...	5
Females .....	...	...	...	1	...	...	2	...	...	...	...	...	...	3
Total .....	...	1	1	1	..	1	3	1	...	...	...	...	...	8
Males .....	...	...	...	...	...	1	2	1	2	3	2	...	...	11
Females .....	1	...	..	2	...	1	...	...	3	...	1	...	...	8
Total .....	1	...	...	2	...	2	2	1	5	3	3	...	...	19
Males .....	...	...	...	...	...	...	...	...	...	...	1	...	...	1
Females .....	...	...	...	...	...	...	...	...	1	...	2	...	...	3
Total .....	...	...	...	...	...	...	...	...	1	...	3	...	...	4
Males .....	...	...	1	...	...	...	...	...	1	1	...	...	...	3
Females .....	...	...	1	...	...	...	...	...	...	1	...	...	...	2
Total .....	...	...	2	...	...	...	...	...	1	2	...	...	...	5
Males .....	...	...	...	1	...	...	...	...	...	...	...	...	...	1
Females .....	...	...	...	...	1	2	1	3	1	...	2	...	...	10
Total .....	...	...	...	1	1	2	1	3	1	...	2	...	...	11
Males .....	...	...	...	...	...	...	...	...	2	2	1	...	...	5
Females .....	...	...	...	...	...	1	...	...	...	...	...	...	...	1
Total .....	...	...	...	...	...	1	...	...	2	2	1	...	...	6

TABLE E.—

CAUSE OF DEATH.	MONTHS.												Total.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
Endocarditis (Inflammation of Membrane of Heart).....M		2	1	....	1	....	....	....	....	....	1	....	5
.....F	2	1	1	....	1	1	1	....	....	....	1	....	8
Total .....	2	3	2	....	2	1	1	....	....	....	2	....	13
Hydrops Pericardii (Dropsy of Heart) ..M	2	1	2	....	1	3	1	....	3	1	1	1	16
.....F	1	3	3	2	3	1	....	....	2	4	....	1	20
Total .....	3	4	5	2	4	4	1	....	5	5	1	2	36
Hypertrophia Cordis (Enlarge't of Heart) M	....	1	....	....	1	1	1	1	1	3	1	1	11
.....F	1	3	....	....	....	1	....	2	....	....	1	1	8
Total .....	1	4	....	....	1	1	2	1	3	3	1	2	19
Morbus Valvularum Cordis (Valvular Disease of the Heart) .....	52	45	53	54	34	36	33	38	24	41	47	43	500
.....M	48	46	51	44	34	36	29	38	42	30	35	54	487
.....F	48	46	51	44	34	36	29	38	42	30	35	54	487
Total .....	100	91	104	98	68	72	62	76	66	71	82	97	987
Pericarditis .....	1	1	....	....	1	1	....	....	1	2	....	1	8
.....M	....	....	3	....	....	2	2	....	....	3	....	....	10
.....F	....	....	3	....	....	2	2	....	....	3	....	....	10
Total .....	1	1	3	....	1	3	2	....	1	5	....	1	18
Syncope (Fainting) .....	....	....	1	....	....	1	....	....	2	1	3	....	8
.....M	....	1	1	....	....	....	2	1	1	....	1	....	7
.....F	....	1	1	....	....	....	2	1	1	....	1	....	7
Total .....	....	1	2	....	....	1	2	1	3	1	4	....	15
ORDER 3. DISEASE OF THE RESPIRATORY SYSTEM.— <i>Pneumonic</i> .													
Apoplexia Pulmonalis (Congestion of Lungs) .....	20	24	32	24	22	11	9	7	7	13	19	24	212
.....M	24	24	21	24	14	14	5	9	11	19	13	23	201
.....F	24	24	21	24	14	14	5	9	11	19	13	23	201
Total .....	44	48	53	48	36	25	14	16	18	32	32	47	413
Bronchitis .....	21	16	38	35	29	30	15	11	12	18	17	24	266
.....M	24	22	27	44	17	17	10	6	10	13	20	22	232
.....F	24	22	27	44	17	17	10	6	10	13	20	22	232
Total .....	45	38	65	79	46	47	25	17	22	31	37	46	498
Emphysema (Injuries to Lungs) .....	....	....	....	1	....	....	....	....	1	1	....	....	3
.....M	1	....	....	....	2	1	....	....	1	....	1	....	6
.....F	1	....	....	....	2	1	....	....	1	....	1	....	6
Total .....	1	....	....	1	2	1	....	....	2	1	1	....	9



DEATHS,—Continued.

SEX.	AGES.													Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	
Males .....				1				2	1	1				5
Females .....	1		1	1	1		1	1	1	1				5
Total .....	1		1	2	1		1	3	2	2				13
Males .....		1		1		1		2	1	6	3	1		16
Females .....			1			1	2	1	5	5	3	2		20
Total .....		1	1	1		2	2	3	6	11	6	3		36
Males .....				1	1	1	1			1	2	4		11
Females .....				1	1		2		1	1	1		1	8
Total .....				2	2	1	3		1	2	3	4	1	19
Males .....	16	10	6	9	24	35	36	36	63	114	108	33	..	500
Females .....	14	12	17	13	17	40	56	53	61	92	75	19	....	487
Total .....	30	22	23	22	41	75	92	89	124	206	183	52	....	987
Males .....		1	1					1	2	1		1		8
Females .....	1			2		1	4		1	1				10
Total .....	1	1	1	2		1	4	1	3	2		1		18
Males .....	2		1			1	1	1	1	1				8
Females .....						1	3				2			7
Total .....	2		1			2	4	1	1	1	2			15
Males .....	58	26	11	4	5	14	8	15	18	14	16	18	1	212
Females .....	52	31	11	4	4	5	17	22	13	16	9	8	1	201
Total .....	110	57	22	8	9	19	25	37	31	30	25	26	2	413
Males .....	109	44	7	2		7	3	6	14	25	24	9	1	266
Females .....	61	50	8	3	4	6	7	8	14	18	31	14		232
Total .....	170	94	15	5	4	13	10	14	28	43	55	23	1	498
Males .....						2		1						3
Females .....					1	2	2	1						6
Total .....					1	4	2	2						9



TABLE E.—

CAUSE OF DEATH.	MONTHS.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Hydrothorax (Dropsy of Chest) .....M	1	1	....	1	...	...	...	...	1	3	....	1	8
.....F	1	....	....	....	....	2	....	1	....	1	2	1	8
Total .....	2	1	....	1	....	2	....	1	1	4	2	2	16
Laryngitis .....M	1	1	1	2	5	2	2	....	2	2	5	3	26
.....F	2	3	1	2	....	2	2	1	....	3	2	2	20
Total .....	3	4	2	4	5	4	4	1	2	5	7	5	46
Pleurisy.....M	4	3	4	2	2	1	3	....	....	5	4	2	28
.....F	1	2	3	4	2	1	2	3	2	1	2	2	25
Total .....	5	5	7	6	4	2	5	3	2	4	6	4	53
Pneumonia .....M	85	78	119	123	91	43	33	23	34	47	69	75	820
.....F	63	75	82	111	64	48	37	21	33	40	48	65	687
Total .....	148	153	201	234	155	91	70	44	67	87	117	140	1507
ORDER 4. DISEASES OF THE DIGESTIVE SYSTEM. <i>Enterici.</i>													
Ascites (Abdominal Dropsy) .....M	....	....	....	....	....	1	2	....	1	....	....	....	4
.....F	....	1	....	1	....	1	1	....	1	....	....	1	6
Total.....	....	1	....	1	....	2	3	....	2	....	....	1	10
Chololithus (Gall Stones) .....M	....	....	....	....	1	....	1	1	....	....	....	....	3
.....F	....	....	....	....	....	....	1	....	....	....	....	....	1
Total .....	....	....	....	....	1	....	2	1	....	....	....	....	4
Cirrhosis of Liver.....M	3	3	3	3	5	1	....	4	2	6	4	3	37
.....F	1	2	....	2	1	....	2	....	1	2	1	2	14
Total.....	4	5	3	5	6	1	2	4	3	8	5	5	51
Colica .....M	1	....	....	....	....	....	....	....	6	1	....	....	8
.....F	....	1	....	....	....	1	....	....	1	....	....	1	4
Total.....	1	1	....	....	....	1	....	....	7	1	....	1	12
Dyspepsia .....M	7	3	4	8	2	2	5	5	5	2	5	6	54
.....F	2	3	....	2	1	2	2	2	5	5	2	4	30
Total.....	9	6	4	10	3	4	7	7	10	7	7	10	84

DEATHS.—*Continued.*

SEX.	AGES.													Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	
Males .....					1		1	3	2		1			8
Females .....								1	1	3	3			8
Total .....					1		1	4	3	3	4			16
Males .....	4	4	3	1	3	2	2	4	1	1				26
Females .....	2	6	1		1	3		2	1	1				20
Total .....	6	10	4	1	4	5	2	6	2	2				46
Males .....	1	2	2		4	2	2	7	2	3	3			28
Females .....	1	2	2		2	3	1	3	5	3	2	1		25
Total .....	2	4	4		6	5	3	10	7	6	5	1		53
Males .....	155	135	29	15	28	67	66	65	75	78	58	24	1	820
Females .....	103	100	37	17	31	71	62	49	59	55	51	21	5	687
Total .....	258	235	66	32	59	138	128	114	134	133	109	45	6	1507
Males .....								1	1	1	1			4
Females .....									1	1	4			6
Total .....								1	2	2	5			10
Males .....								1	1	1				3
Females .....										1				1
Total .....								1	1	2				4
Males .....						3	3	3	7	10	6	2		37
Females .....						2	3	1	2	5	1			14
Total .....						5	6	4	9	15	7	2		51
Males .....	3	4	1											8
Females .....	1	1						1	1					4
Total .....	4	5	1					1	1					12
Males .....						5	5	4	7	14	14			54
Females .....		2				3	3	2	3	9	2	1		30
Total .....		2				8	8	6	10	23	16	1		84



DEATHS.—*Continued.*

SEX.	AGES.														Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.	
Males .....	75	32	18	4	21	33	11	22	16	18	9	2	.....	7	268
Females .....	63	20	13	17	13	20	26	15	16	19	15	5	.....	6	248
Total .....	138	52	31	21	34	53	37	37	32	37	24	7	.....	13	516
Males .....	19	2	.....	1	3	4	3	5	9	17	11	1	.....	3	77
Females .....	13	5	4	2	2	3	9	2	9	5	7	1	.....	4	66
Total .....	32	7	4	3	5	7	12	7	18	22	18	2	.....	7	143
Males .....	2	.....	.....	.....	.....	.....	.....	2	3	.....	.....	.....	.....	1	9
Females .....	.....	.....	.....	1	1	2	.....	1	2	2	.....	.....	.....	1	10
Total .....	2	.....	.....	1	1	2	.....	3	5	2	.....	.....	.....	2	19
Males .....	1	2	2	2	1	6	5	10	14	24	13	1	.....	.....	81
Females .....	1	.....	.....	.....	1	3	7	6	12	16	9	4	.....	2	61
Total .....	2	2	2	2	2	9	12	16	26	40	22	5	.....	2	142
Males .....	1	1	.....	.....	.....	1	1	1	2	1	5	2	.....	4	19
Females .....	.....	.....	.....	2	.....	1	2	2	1	4	5	1	.....	1	19
Total .....	1	1	.....	2	.....	2	3	3	3	5	10	3	.....	5	38
Males .....	1	3	.....	.....	.....	1	3	1	6	7	2	2	.....	1	27
Females .....	6	1	.....	.....	.....	1	1	1	6	5	5	1	.....	1	28
Total .....	7	4	.....	.....	.....	2	4	2	12	12	7	3	.....	2	55
Males .....	5	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	6
Females .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1
Total .....	5	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	7
Males .....	2	2	.....	2	.....	1	1	1	.....	2	.....	.....	.....	.....	11
Females .....	.....	.....	2	.....	.....	.....	1	.....	2	2	1	.....	.....	2	10
Total .....	2	2	2	2	.....	1	2	1	2	4	1	.....	.....	2	21
Males .....	4	.....	1	4	6	9	7	4	2	5	4	1	.....	1	51
Females .....	2	4	9	3	8	18	12	5	5	2	2	.....	.....	6	76
Total .....	6	4	10	7	14	27	19	9	7	7	6	1	.....	10	127
Males .....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	2
Females .....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	2
Total .....	.....	.....	1	.....	.....	.....	.....	.....	1	2	.....	.....	.....	.....	4





DEATHS.—*Continued.*

SEX.	AGES.														Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.	
Males .....	1										1				2
Females .....	2														2
Total .....	3										1				4
Males .....									2		2				5
Females .....										1					1
Total .....									2	2	2				6
Males .....				1		1			2	1	1			1	7
Females .....						1	1			2	2			2	8
Total .....				1		2	1		2	3	3			3	15
Males .....	2				1	2	1	2	3		2				13
Females .....		1		1		3	1	2	2	2	1	1		3	17
Total .....	2	1		1	1	5	2	4	5	2	3	1		3	30
Males .....						1				1	1			1	4
Females .....															
Total .....						1				1	1			1	4
Males .....					3	2		2	4	15	15	7	1	3	52
Females .....								1	2	2					5
Total .....					3	2		3	6	17	15	7	1	3	57
Males .....	1	1	1	4	5	12	6	2	6	5	8	3			54
Females .....	1		1	3	2	4	1	2	3	6	6			1	30
Total .....	2	1	2	7	7	16	7	4	9	11	14	3		1	84
Males .....				1						1	1	2	1		6
Females .....															
Total .....				1						1	1	2	1		6
Males .....						1			1	4	6	7			19
Females .....															
Total .....						1			1	4	6	7			19



TABLE E.—

CAUSE OF DEATH.	MONTHS.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Nephria (Bright's Disease).....M	5	15	11	14	11	5	5	7	5	8	8	7	101
.....F	6	3	3	7	3	5	3	9	4	3	5	8	59
Total .....	11	18	14	21	14	10	8	16	9	11	13	15	160
Nephritis (Inflammation of Kidneys)....M	10	12	8	6	12	7	8	4	6	8	8	8	97
.....F	10	7	6	3	4	6	6	4	4	5	5	5	65
Total .....	20	19	14	9	16	13	14	8	10	13	13	13	162
Stricture of Urethra.....M	1	...	1	...	...	...	...	...	...	...	1	1	4
.....F	...	...	...	1	...	...	...	...	...	...	...	...	1
Total.....	1	...	1	1	...	...	...	...	...	...	1	1	5
ORDER 6. DISEASES OF THE GENERATIVE ORGANS.— <i>Genitici</i> .													
Hydrops Ovarii (Ovarian Dropsy).....F	...	1	...	...	...	2	...	...	1	...	...	...	4
Metritis (Inflammation of Womb).....F	1	3	2	3	2	2	1	...	2	1	...	2	19
Morbus Uteri.....F	1	...	1	1	...	1	...	1	...	...	...	...	5
Tumor Ovarii.....F	4	2	3	5	...	4	4	3	2	5	6	3	41
Tumor Uteri.....F	4	5	4	4	6	1	1	5	2	3	6	2	43
ORDER 7. DISEASES OF THE LOCOMOTIVE SYSTEM.— <i>Myostici</i> .													
Arthritis (Inflammation of Joints)....M	...	1	...	...	3	1	1	...	...	1	...	2	9
.....F	1	...	...	2	1	...	...	...	...	...	...	1	5
Total .....	1	1	...	2	4	1	1	...	...	1	...	3	14
Caries (Bones).....M	1	...	2	2	1	...	...	1	...	...	...	...	7
.....F	1	...	1	...	...	1	...	...	1	...	...	1	5
Total .....	2	...	3	2	1	1	...	1	1	...	...	1	12
Synovitis.....M	...	...	...	...	...	...	...	...	...	...	...	...	...
.....F	...	...	...	...	...	...	...	...	1	1	...	...	2
Total .....	...	...	...	...	...	...	...	...	1	1	...	...	2

DEATHS.—Continued.

		AGES.														
SEX.		Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.	Total.
Males	.....		2	1	2	4	6	7	9	21	26	13	8	.....	2	161
Females	.....		1	1	1	4	5	8	10	14	10	1	3	.....	2	59
Total	.....		2	2	3	8	11	15	19	35	36	14	11	.....	4	160
Males	.....	2	2	5	2	2	6	5	7	9	11	32	9	.....	5	97
Females	.....	4	1	7	.....	3	8	7	6	8	9	8	1	.....	3	65
Total	.....	6	3	12	2	5	14	12	13	17	20	40	10	.....	8	162
Males	.....						2	.....		1	1	.....	.....	.....		4
Females	.....						.....	.....	.....	.....	.....	.....	.....	.....	1	1
Total	.....						2	.....	.....	1	1	.....	.....	.....	1	5
Females	.....								1	1	1	.....	.....	.....	1	4
Females	.....						5	4	4	2	1	.....	.....	.....	3	19
Females	.....						1	.....	2	1	1	.....	.....	.....	.....	.....
Females	.....						5	8	9	11	4	3	.....	.....	1	41
Females	.....						4	9	12	6	8	2	.....	.....	2	43
Males	.....				2	1	.....	1	.....	2	1	1	1	.....	.....	9
Females	.....		1	.....	1	.....	.....	1	.....	1	1	.....	.....	.....	.....	5
Total	.....		1	.....	3	1	.....	2	.....	3	2	1	1	.....	.....	14
Males	.....	1	1	1	1	.....	1	2	.....	.....	.....	1	.....	.....	.....	7
Females	.....	1	1	.....	1	.....	1	.....	1	.....	.....	.....	.....	.....	.....	5
Total	.....	1	2	1	2	.....	2	2	1	.....	.....	1	.....	.....	.....	12
Males	.....															
Females	.....	1	.....				1	.....	.....	.....	.....	.....	.....	.....	.....	2
Total	.....	1	.....				1	.....	.....	.....	.....	.....	.....	.....	.....	2

TABLE E.—

CAUSE OF DEATH.	MONTHS.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
ORDER 8. DISEASES OF THE INTEGUMENTARY SYSTEM.— <i>Chrotoci.</i>													
Abscess.....M	9	9	8	9	7	7	6	10	5	9	8	7	94
“.....F	5	2	3	2	4	3	2	4	3	4	4	6	54
Total .....	14	17	11	17	11	10	8	14	8	13	12	13	148
Eczema.....M			1										1
“.....F									1				1
Total .....			1						1				2
Phlegmon.....M													
“.....F	2												2
Total .....	2												2
Total Local Diseases.....M	379	370	449	448	372	316	312	306	288	313	341	399	4293
“.....F	336	368	368	416	270	284	248	263	292	258	283	335	3721
Total .....	715	738	817	864	642	600	560	569	580	571	624	734	8014
CLASS IV. DEVELOPMENTAL DISEASES.— <i>Metamorphici.</i>													
ORDER 1. DEVELOPMENTAL DISEASES OF CHILDREN.— <i>Paidiei.</i>													
Amentia (Idiocy).....M												1	1
“.....F													
Total .....												1	1
Anus Imperforatus.....M	1	1	1					1		1	1		6
“.....F	2	2		1	1	1		1			1	1	10
Total .....	3	3	1	1	1	1		2		1	2	1	16
Atelectasis Pulmonum.....M	1	2		1	1		3	1	1	2			12
“.....F	2				2		1	2	2	2			11
Total .....	3	2		1	3		4	3	3	4			23
Cyanosis.....M	2	1		8	3	1			1	2	3	1	22
“.....F	1	3			4			2	1		2	1	14
Total .....	3	4		8	7	1		2	2	2	5	2	36

## DEATHS—Continued.

SEX.	AGES.														Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.	
Males.....	11	6	2	2	6	16	14	10	11	7	4	4	.....	1	94
Females.....	3	7	2	2	3	6	6	9	4	5	4	1	.....	2	54
Total .....	14	13	4	4	9	22	20	19	15	12	8	5	.....	3	148
Males.....		1													1
Females.....	1														1
Total .....	1	1													2
Males.....															
Females.....	1						1								2
Total .....	1						1								2
Males.....	859	420	129	80	138	298	252	307	392	579	511	195	12	121	4293
Females.....	601	381	160	101	133	288	312	294	360	450	360	136	8	137	3721
Total .....	1460	801	289	181	271	586	564	601	752	1029	871	331	20	258	8014
Males.....		1													1
Females.....															
Total .....		1													1
Males.....	6														6
Females.....	10														16
Total .....	16														16
Males.....	11	1													12
Females.....	10	1													11
Total .....	21	2													23
Males.....	20	2													22
Females.....	12	1		1											14
Total .....	32	3		1											36

TABLE. E.—

CAUSE OF DEATH.	MONTHS.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Dentitio (Teething).....M	1	5	7	8	3	3	4	8	11	6	6	5
.....F	5	4	4	3	3	2	5	13	11	3	7	4
Total .....	12	9	11	11	6	5	9	21	22	9	13	9
Hæmorrhagia Umbilicalis.....M	1	1	2	.....	.....	1	.....	5	5	4	.....	19
.....F	.....	.....	1	1	.....	.....	.....	.....	.....	.....	1	4
Total.....	1	1	3	1	.....	1	.....	5	5	4	1	23
Præternatural Birth.....M	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
.....F	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	1	3
Total .....	.....	.....	.....	.....	1	.....	.....	.....	2	.....	1	4
Still Birth.....M	16	21	25	24	25	20	17	18	27	15	21	22
.....F	14	17	18	23	20	11	14	18	20	12	17	9
Total .....	30	38	43	47	45	31	31	36	47	27	38	31
Premature Birth.....M	19	17	15	9	20	13	13	16	15	12	11	20
.....F	8	14	12	16	13	15	13	16	13	15	10	13
Total.....	27	31	27	25	33	28	26	32	28	27	21	33
Spina Binda.....M	.....	1	1	1	.....	1	1	1	.....	1	.....	1
.....F	2	2	.....	3	.....	1	2	.....	.....	1	1	12
Total.....	2	3	1	4	.....	2	3	1	.....	2	1	20
ORDER 2. DEVELOPMENTAL DISEASES OF WOMEN.— <i>Gyniact.</i>												
Abortion and Miscarriage.....F	1	2	1	2	2	3	2	1	1	1	1	18
Clinnacteria.....F	2	.....	.....	1	1	1	1	.....	.....	1	1	8
Eclampsia Parturi.....F	6	6	3	2	9	5	4	2	1	5	4	47
Puerperal Fever.....F	14	11	14	5	9	8	9	8	8	2	4	98
Post Partum.....F	1	.....	1	.....	2	1	.....	.....	4	2	.....	11
Partus (Childbirth).....F	16	20	17	22	20	8	9	14	7	7	17	174
Milk Leg.....F	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1



DEATHS—Continued.

SEX.	AGES.													Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	
Males .....	45	28												73
Females .....	40	24												64
Total .....	85	52												137
Males .....	9	10												19
Females .....	4													4
Total .....	13	10												23
Males .....	1													1
Females .....	3													3
Total .....	4													4
Males .....	251													251
Females .....	193													193
Total .....	444													444
Males .....	180													180
Females .....	158													158
Total .....	338													338
Males .....	8													8
Females .....	12													12
Total .....	20													20
Females .....						10	6	1						17
Females .....								1	3	4				8
Females .....					5	23	15	2						45
Females .....					6	44	32	9						91
Females .....						4	4	2						10
Females .....						8	68	74	21					171
Females .....						1								1



TABLE E.—

CAUSE OF DEATH.	MONTHS.													
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	
ORDER 3. DEVELOPMENTAL DISEASES OF OLD PEOPLE.— <i>Geriatrici</i> .														
Senectus (Old Age) .....	M	101	93	132	98	92	81	62	65	85	86	84	103	1082
.....	F	95	89	120	95	72	64	69	68	72	99	89	107	1039
Total .....		196	182	252	193	164	145	131	133	157	185	173	210	2121
Total Developmental Diseases.....	M	148	142	183	149	145	120	100	115	145	129	126	153	1655
.....	F	169	170	191	174	158	120	129	145	142	151	156	160	1865
Grand Total .....		317	312	374	323	303	240	229	260	287	280	282	313	3520
CLASS V. VIOLENCE TENDING TO SUDDEN DEATH.— <i>Thanatici</i> .														
ORDER 1. ACCIDENT AND NEGLIGENCE.														
Ambusta (Burns and Scalds).....	M	2	3	3	1	1	4	3	3	2	3	3	28	
.....	F	3	4	1	3	3	4	2	2	1	2	.....	25	
Total.....		5	7	4	4	3	5	6	5	3	5	3	53	
Amputation .....	M	.....	.....	.....	1	1	1	.....	.....	.....	.....	2	5	
.....	F	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Total.....		.....	.....	.....	1	1	1	.....	.....	.....	.....	2	5	
Concussion of Brain.....	M	.....	1	1	.....	2	1	2	1	1	.....	.....	9	
.....	F	.....	.....	1	1	.....	.....	1	1	.....	.....	.....	4	
Total.....		.....	1	2	1	2	1	3	2	1	.....	.....	13	
Contusion .....	M	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	
.....	F	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Total.....		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	
Explosion .....	M	.....	.....	.....	1	.....	.....	.....	1	.....	.....	1	3	
.....	F	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	
Total.....		.....	.....	.....	2	.....	.....	.....	1	.....	.....	1	4	
Fracture .....	M	6	3	5	1	2	1	.....	1	.....	1	1	3	24
.....	F	1	1	2	.....	1	.....	.....	.....	1	.....	2	8	
Total.....		7	4	7	1	3	1	.....	1	.....	2	1	5	32

## DEATHS—Continued.

SEX.	AGES.													
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	
													Unknown.	Total.
Males .....											451	519	112	1082
Females .....											444	480	115	1039
Total .....											895	999	227	2121
Total Males .....	531	42									451	519	112	1655
“ Females .....	442	26	1	11	90	125	89	24	4	444	480	115	14	1865
Grand Total .....	973	68	1	11	90	125	89	24	4	895	999	227	14	3520
Males .....	3	18				2	2		1		1	1		24
Females .....	1	15		2		1	2			1	2	1		25
Total .....	4	33		2		3	4		1	1	3	2		53
Males .....		1					1	2				1		5
Females .....														
Total .....		1					1	2				1		5
Males .....		2	1				1		2	2				9
Females .....						1				2	1			4
Total .....		2	2			1	1		2	4	1			13
Males .....						1								1
Females .....														
Total .....						1								1
Males .....				1		1			1					3
Females .....						1								1
Total .....				1		2			1					4
Males .....			1	1	2	1	4	3	2	3	1	2		24
Females .....						1		1			3	3		8
Total .....			1	1	2	2	4	4	2	3	4	5		32

TABLE E.—

CAUSE OF DEATH.		MONTHS.												Total.
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
Freezing .....	M	3	1	1							1		1	7
“ .....	F												1	1
Total.....		3	1	1							1		2	8
Lightning .....	M					1	1	1	1					4
“ .....	F													
Total.....						1	1	1	1					4
Suffocation .....	M			2	4	2		1	2	3	2	2	2	20
“ .....	F	1								1		2		4
Total.....		1		2	4	2		1	2	4	2	4	2	24
Drowning .....	M	4		7	16	11	18	27	21	15	8	7	6	140
“ .....	F		1	1	5	2	5	5	2		4	5		30
Total.....		4	1	8	21	13	23	32	23	15	12	12	6	170
Poison .....	M	2	2	1	1	2	2	2	5	3				20
“ .....	F		1			1	1	3		1			1	8
Total.....		2	3	1	1	3	3	5	5	4			1	28
Wounds .....	M	19	15	17	22	25	23	24	22	18	21	26	20	252
“ .....	F	4	5	2	3	4	6	4	1	4	7	8	1	49
Total .....		23	20	19	25	29	29	28	23	22	28	34	21	301
Killed by Cars .....	M	3	2	2	4	3	7	6	4	10	4	4	1	50
“ .....	F					1		1	1			1	1	5
Total.....		3	2	2	4	4	7	7	5	10	4	5	2	55
ORDER 2. HOMICIDE.														
Murder and Manslaughter.....	M	1	1	2					1					5
“ .....	F	1		1										2
Total.....		2	1	3					1					7
ORDER 3. SUICIDE.														
Submersis (Drowning).....	M				1			2				1		4
“ .....	F		1							1				2
Total .....			1		1			2		1		1		6

DEATHS—Continued.

SEX.	AGES.														Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.	
Males .....						1		1		2	1			2	7
Females .....									1						1
Total .....						1		1	1	2	1			2	8
Males .....						1	1	2							4
Females .....															
Total .....						1	1	2							4
Males .....	2	2			1	3	3	2		4	1			2	20
Females .....	3								1						4
Total .....	5	2			1	3	3	2	1	4	1			2	24
Males .....		11	23	17	17	24	13	15	2	3	2	2		11	140
Females .....	1	10	5	5	11		5				1	1			30
Total .....	1	21	28	22	28	24	18	15	2	3	3	3		11	170
Males .....		4				4	1	5	2	3	1				20
Females .....	1	2				3			1	1					8
Total .....	1	6				7	1	5	3	4	1				28
Males .....	2	14	5	16	32	49	28	27	27	24	16	3	1	8	252
Females .....	2	4	4	2	1	3	1	4	4	10	8	3	3		49
Total .....	4	18	9	18	33	52	29	31	31	34	24	6	4	8	301
Males .....			1	2	3	16	8	6	3	5	4			2	50
Females .....					1		1		1	2					5
Total .....			1	2	4	16	9	6	4	7	4			2	55
Males .....						1	1	1			1			1	5
Females .....									1	1					2
Total .....						1	1	1	1	1	1			1	7
Males .....						2		2							4
Females .....									1	1					2
Total .....						2		2	1	1					6

TABLE E.—

CAUSE OF DEATH.	MONTHS.												Total.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
Suspendium (Hanging) .....M	1	.....	.....	6	2	3	1	.....	3	3	2	1	22
“ “ .....E	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1
Total .....	1	.....	.....	6	2	3	1	1	3	3	2	1	23
Venenatio (Poison) .....M	.....	1	.....	2	.....	.....	.....	1	.....	.....	1	.....	5
“ “ .....F	.....	.....	.....	.....	.....	.....	1	.....	1	1	2	2	7
Total.....	.....	1	.....	2	.....	.....	1	1	1	1	3	2	12
Vulnera (Wounds).....M	1	1	1	1	1	3	3	.....	.....	1	.....	.....	12
“ “ .....F	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	2
Total .....	1	1	2	2	1	3	3	.....	.....	1	.....	.....	14
Total Violent Deaths.....M	43	30	42	60	50	62	73	63	57	44	47	40	611
“ “ “ .....F	10	13	9	13	13	16	16	8	9	14	20	8	149
Total.....	53	43	51	73	63	78	89	71	66	58	67	48	760
Other Diseases and Cause not Specified...M	35	24	28	36	27	28	34	26	30	23	34	24	349
“ “ “ .....F	48	44	45	42	33	26	33	42	29	42	45	35	464
Total.....	83	68	73	78	60	54	67	68	59	65	79	59	803

## DEATHS—Continued.

SEX.	AGES.														Total.
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.	
Males .....					1	...	3	3	2	4	7	...	...	2	22
Females .....									1	...	...	...	...		1
Total .....					1	...	3	3	3	4	7	...	...	2	23
Males .....					1	...		1	1	1	...	...	...	1	5
Females .....					1	3	...	1	1	...	...	...	...	1	7
Total .....					2	3	...	2	2	1	...	...	...	2	12
Males .....				1	...	1	...	3	2	2	2	...	...	1	12
Females .....							...	1	...	...	...	1	...	...	2
Total .....				1	...	1	...	4	2	2	2	1	...	1	14
Males .....	7	52	31	37	56	105	66	67	50	51	34	19	1	35	611
Females .....	8	21	9	9	13	11	12	5	10	20	17	9	4	1	149
Total .....	15	73	40	46	69	116	78	72	60	71	51	28	5	36	760
Males .....	3	29	30	14	24	45	31	41	49	22	...	...	...	61	349
Females .....	1	61	41	46	37	60	41	45	42	37	...	...	...	53	464
Total .....	4	90	71	60	61	105	72	86	91	59	...	...	...	114	803



TABLE E.—DEATHS BY

CAUSE OF DEATH.	MONTHS.												Total.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
CLASS I.													
Total Zymotic Diseases . . . . .M	185	169	183	152	145	117	186	311	360	252	174	167	2401
“ “ . . . . .F	191	163	204	151	139	91	176	276	268	232	171	176	2238
Total . . . . .	376	332	387	303	284	208	362	587	628	484	345	343	4639
CLASS II.													
Total Constitutional Diseases . . . . .M	232	226	246	219	222	216	227	217	247	202	186	173	2613
“ “ . . . . .F	215	274	292	237	229	194	250	229	255	255	199	196	2825
Total . . . . .	447	500	538	456	451	410	477	446	502	457	385	369	5438
CLASS III.													
Total Local Diseases . . . . .M	379	370	449	448	372	316	312	306	288	313	341	399	4293
“ “ . . . . .F	336	368	368	416	270	284	248	263	292	258	283	335	3721
Total . . . . .	715	738	817	864	642	600	560	569	580	571	624	734	8014
CLASS IV.													
Total Developmental Diseases . . . . .M	148	142	183	149	145	120	100	115	145	129	126	153	1655
“ “ . . . . .F	169	170	191	174	158	120	129	145	142	151	156	160	1865
Total . . . . .	317	312	374	323	303	240	229	260	287	280	282	313	3520
CLASS V.													
Total Violent Deaths . . . . .M	43	30	42	60	50	62	73	63	57	44	47	40	611
“ “ . . . . .F	10	13	9	13	13	16	16	8	9	14	20	8	149
Total . . . . .	53	43	51	73	63	78	89	71	66	58	67	48	760
Total Deaths from other Causes and Cause not specified . . . . .M	35	24	28	36	27	28	34	26	30	23	34	24	349
“ “ . . . . .F	48	44	45	42	33	26	33	42	29	42	45	35	464
Total . . . . .	83	68	73	78	60	54	67	68	59	65	79	59	813
Total—Males . . . . .	1022	961	1131	1064	961	859	932	1038	1127	963	908	956	11922
“ Females . . . . .	969	1032	1109	1033	842	731	852	963	995	952	874	910	11262
Grand Total . . . . .	1991	1993	2240	2097	1803	1590	1784	2001	2122	1915	1782	1866	23184

## CLASSES.—RECAPITULATION.

SEX.	AGES.													
	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.
Males .....	712	758	340	111	74	93	58	56	47	47	54	15	....	36
Females .....	629	711	346	125	73	104	65	25	30	37	25	15	2	51
Total .....	1341	1469	686	236	147	197	123	81	77	84	79	30	2	87
Males .....	824	166	28	23	86	394	243	175	184	224	160	51	3	52
Females .....	676	138	43	47	189	561	316	229	188	222	107	47	4	58
Total .....	1500	304	71	70	275	955	559	404	372	446	267	98	7	110
Males .....	859	420	129	80	138	298	252	307	392	579	511	195	12	121
Females .....	601	381	160	101	133	288	312	294	360	450	360	136	8	137
Total .....	1460	801	289	181	271	586	564	601	752	1029	871	331	20	258
Males .....	531	42	....	....	....	....	....	....	....	....	451	519	112	....
Females .....	442	26	....	1	11	90	125	89	24	4	444	480	115	14
Total .....	973	68	....	1	11	90	125	89	24	4	895	999	227	14
Males .....	7	52	31	37	56	105	66	67	50	51	34	19	1	35
Females .....	8	21	9	9	13	11	12	5	10	20	17	9	4	1
Total .....	15	73	40	46	69	116	78	72	60	71	51	28	5	36
Males .....	3	29	30	14	24	45	31	41	49	22	....	....	....	61
Females .....	1	61	41	46	37	60	41	45	42	37	....	....	....	53
Total .....	4	90	71	60	61	105	72	86	91	59	....	....	....	114
Males .....	2936	1467	558	265	378	935	650	646	722	923	1210	799	128	305
Females .....	2357	1338	599	329	456	1114	871	687	654	770	953	687	133	314
Total .....	5293	2805	1157	594	834	2049	1521	1333	1376	1693	2163	1486	261	619

H. S. CREWE,  
*Inspector.*

TABLE F.—DEATH BY COUNTIES.—

COUNTIES.	CLASS I.—ZYMOTIC								
	Cholera Infantum.	Cholera Morbus.	Cynanche Trachealis (Membranous Croup).	Diarrhoea Acuta (Acute Diarrhoea).	Dysenteria Acuta (Acute Dysentery).	Diphtheria.	Erysipelas.	Febris Typhoides (Typhoid Fever).	Scarlatina (Scarlet Fever).
Algoma :									
Males.....	6		1	5	1	9	3	1	.....
Females.....			3	2	2	9	1	.....	3
Total .....	6		4	7	3	18	4	1	2
Brant :									
Males.....	4		3	4	.....	13	1	9	1
Females.....	4		1	6	2	19	2	3	3
Total .....	8		4	10	2	32	3	12	4
Bruce :									
Males.....	3		7	9	.....	4	2	5	.....
Females.....	4		2	4	.....	2	.....	4	4
Total .....	7		9	13	.....	6	2	9	4
Carleton :									
Males.....	19	1	11	31	3	24	2	6	4
Females.....	14		18	49	2	33	.....	6	7
Total .....	33	1	29	80	5	57	2	12	11
Dufferin :									
Males.....	1		.....	2	.....	10	.....	1	2
Females.....	1		2	1	1	5	.....	.....	.....
Total .....	2		2	3	1	15	.....	1	2
Elgin :									
Males.....	7		9	2	.....	19	1	5	3
Females.....	5		6	1	.....	9	1	2	.....
Total .....	12		15	3	.....	28	2	7	3
Essex :									
Males.....	2		20	10	1	48	2	10	9
Females.....	10		22	9	2	54	.....	11	2
Total .....	12		42	19	3	102	2	21	11
Frontenac :									
Males.....	2	1	8	6	.....	9	2	1	15
Females.....	2	2	6	6	.....	13	1	3	12
Total .....	4	3	14	12	.....	22	3	4	27
Grey :									
Males.....	5	1	4	4	1	3	5	3	2
Females.....	1	1	3	8	2	6	.....	4	3
Total .....	6	2	7	12	3	9	5	7	5

## CAUSES OF DEATHS, 1886.

DISEASES										CLASS II.—CONSTITUTIONAL DISEASES.					
Other Fevers.	Influenza.	Morbilli (Measles).	Whooping Cough.	Pyæmia.	Varicella (Small Pox).	Syphilis.	Alcoholism.	Other Zymotic Diseases.	Total Zymotic Diseases.	Anæmia.	Anasarca (General Dropsy).	Asthma.	Carcinoma (Cancer).	Rheumatism.	
.....	.....	1	1	1	.....	1	1	.....	30	13	2	1	4	.....	.....
.....	.....	1	2	.....	.....	1	.....	1	24	9	2	1	1	.....	.....
.....	.....	1	3	1	.....	2	1	1	54	22	4	2	5	.....	.....
5	.....	.....	.....	.....	.....	.....	.....	2	42	7	.....	1	5	1	.....
5	.....	1	.....	.....	.....	.....	.....	.....	46	7	11	.....	5	.....	.....
10	.....	1	.....	.....	.....	.....	.....	2	88	14	11	1	10	1	.....
1	.....	.....	3	.....	1	.....	.....	.....	35	25	7	1	8	2	.....
1	.....	.....	2	3	.....	.....	.....	.....	26	42	1	3	4	.....	.....
2	.....	.....	5	3	1	.....	.....	.....	61	67	8	4	12	2	.....
7	1	17	7	1	2	.....	3	3	140	88	1	2	13	2	.....
5	2	21	3	1	10	2	.....	7	180	76	5	2	16	8	.....
12	3	38	10	2	12	2	3	10	320	164	6	4	29	10	.....
2	.....	.....	1	.....	.....	.....	.....	1	20	12	3	1	1	.....	.....
.....	.....	.....	3	.....	.....	.....	.....	.....	13	10	1	.....	.....	.....	.....
2	.....	.....	4	.....	.....	.....	.....	1	33	22	4	1	1	.....	.....
1	.....	.....	3	2	.....	.....	.....	.....	52	17	3	.....	5	1	.....
1	1	.....	1	1	.....	.....	.....	1	29	14	7	.....	1	.....	.....
2	1	.....	4	3	.....	.....	.....	1	81	31	10	.....	6	1	.....
1	.....	.....	2	1	.....	.....	.....	3	109	40	5	4	3	3	.....
7	.....	1	11	1	.....	1	.....	1	132	37	7	.....	4	2	.....
8	.....	1	13	2	.....	1	.....	4	241	77	12	4	7	5	.....
.....	.....	.....	4	.....	.....	.....	.....	3	51	17	4	3	4	4	.....
3	.....	.....	8	.....	.....	.....	.....	1	57	18	2	.....	10	1	.....
3	.....	.....	12	.....	.....	.....	.....	4	108	35	6	3	14	5	.....
8	2	1	2	2	.....	.....	.....	1	44	14	8	5	3	6	.....
5	1	1	2	2	.....	.....	.....	2	41	25	8	.....	2	2	.....
13	3	2	4	4	.....	.....	.....	3	85	39	16	5	5	8	.....

TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS II.— <i>Continued.</i>					CLASS III.—			
	Hydrocephalus.	Phthisis (Consumption).	Scrofula.	Other Constitutional Diseases.	Total Constitutional Diseases.	Apoplexy.	Convulsions.	Encephalitis (Inflammation of Brain).	Epilepsy.
Algoma :									
Males .....	1	11	.....	.....	32	3	2	4	2
Females .....	.....	6	1	.....	20	.....	3	2	.....
Total .....	1	17	1	.....	52	3	7	6	2
Brant :									
Males .....	.....	24	1	.....	39	4	9	.....	.....
Females .....	.....	20	.....	.....	43	4	5	3	.....
Total .....	.....	44	1	.....	82	8	14	3	.....
Bruce :									
Males .....	4	31	.....	.....	78	1	4	3	.....
Females .....	1	29	.....	1	81	4	5	2	1
Total .....	5	60	.....	1	159	5	9	5	1
Carleton :									
Males .....	8	57	9	3	183	8	17	11	2
Females .....	3	83	16	2	211	2	8	9	.....
Total .....	11	140	25	5	394	10	25	20	2
Dufferin :									
Males .....	.....	4	.....	.....	21	1	5	.....	.....
Females .....	3	9	.....	.....	23	2	4	1	.....
Total .....	3	13	.....	.....	44	3	9	1	.....
Elgin :									
Males .....	.....	17	.....	2	45	3	6	8	.....
Females .....	1	22	1	.....	46	2	2	6	1
Total .....	1	39	1	2	91	5	8	14	1
Essex :									
Males .....	4	35	.....	4	98	5	5	2	.....
Females .....	.....	42	.....	3	95	2	2	4	2
Total .....	4	77	.....	7	193	7	7	6	2
Frontenac :									
Males .....	1	29	.....	.....	62	7	15	3	3
Females .....	1	31	.....	1	64	4	5	7	.....
Total .....	2	60	.....	1	126	11	20	10	3
Grey :									
Males .....	2	22	.....	.....	60	3	8	4	1
Females .....	.....	21	.....	1	59	3	2	4	1
Total .....	2	43	.....	1	119	6	10	8	2



CAUSES OF DEATHS, 1886.—*Continued.*

## LOCAL DISEASES.

Insanity.	Meningitis.	Neuroencephalus (Softening of Brain).	Paralysis (Palsy).	Valvular Disease of Heart.	Apoplexia Pulmonalis (Congestion of Lungs).	Bronchitis.	Laryngitis.	Pleurisy.	Pneumonia.	Dyspepsia.	Enteritis (Inflammation of Bowels).	Gastritis (Inflammation of Stomach).	Hepatitis (Inflammation of Liver).	Peritonitis (Inflammation of Abdomen.)
1			1	3	2	2			10		3		2	2
			4	1	1	3			2		13			
1			1	7	3	5			12		5		2	2
1	5		12	9	3	2			20		7	3	1	1
	1		10	15	2	3		1	20		9	5		1
1	6		22	24	5	5		1	40		16	8	1	2
	3		7	7	3	4		1	22	2	8	2		
	2		5	8	1	5		1	17		9	3		
	5		12	15	4	9		2	39	2	17	5		
	4	4	14	41	10	15		2	41	3	10	4	5	2
		1	18	37	14	9			30	1	17	3	2	3
	4	5	32	78	24	24		2	71	4	27	7	7	5
	1			4	2	5	1		13		4		1	1
	1			3		4			5		3	1	2	1
	2			7	2	9	1		18		7	1	3	2
	1	1	7	13	5	1		2	11	1	3	1	1	3
	1	1	8	11	3	1	2		4	1	5		1	
	2	2	15	24	8	2	2	2	15	2	8	1	2	3
	6	1	7	14	1	2		2	23	2	7	1	1	2
	2	1	7	8	2	2		2	27	2	6	3		3
	8	2	14	22	3	4		4	50	4	13	4	1	5
	1	1	7	23	9	9			7		8	2	1	1
	1		5	19	4	6			10		6		1	2
	2	1	12	42	13	15			17		14	2	2	3
	3	1	7	17	9	7	2	1	22	4	5	2	6	1
	1	1	7	13	8	15	1		18		7	2	3	3
1	4	2	14	30	17	22	3	1	40	4	12	4	9	4



TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS III.—Continued.							CLASS IV.	
	Cystitis (Inflammation of Bladder).	Diabetes.	Nephria (Bright's Disease).	Nephritis (Kidney Disease).	Abscess.	Other Local Diseases.	Total Local Diseases.	Dentitio (Teething).	Partus Emortuus (Still Birth).
Algoma :									
Males .....			1		1	4	42	1	2
Females .....			2			1	23		1
Total .....			3		1	5	65	1	3
Brant :									
Males .....		2		7		10	95	1	
Females .....		1	1	1	1	5	89	1	1
Total .....		3	1	8	1	15	184	2	1
Bruce :									
Males .....	1	1		3	4	13	89	3	4
Females .....				2	3	9	77	4	3
Total .....	1	1		5	7	22	166	7	7
Carleton :									
Males .....			7	4	10	17	231	19	29
Females .....	1	2	2	2	4	5	170	17	12
Total .....	1	2	9	6	14	22	401	36	41
Dufferin :									
Males .....				1	1	3	43	1	2
Females .....			2		2	2	33		2
Total .....			2	1	3	5	76	1	4
Elgin :									
Males .....	1	3	1			6	78	2	2
Females .....		1		1	1	6	58		1
Total .....	1	4	1	1	1	12	136	2	3
Essex :									
Males .....			1	6		7	95	1	4
Females .....				3	2	9	89		8
Total .....			1	9	2	16	184	1	12
Frontenac :									
Males .....		3	3	2	1	13	119	3	4
Females .....				3	1		74	2	2
Total .....		3	3	5	2	13	193	5	6
Grey :									
Males .....		3	1	1		10	118	1	6
Females .....		1	1	2	2	15	111	2	1
Total .....		4	2	3	2	25	229	3	6

CAUSES OF DEATHS, 1886.—*Continued.*

—DEVELOPMENTAL DISEASES.					CLASS V.—VIOLENT DEATHS.							Cause not Specified.	Total Number of Deaths.
Factus Intempestivus (Premature Birth).	Diseases incidental to Child Birth.	Senectus (Old Age).	Other Developmental Diseases.	Total Developmental Diseases.	Vulnera, Wounds.	Killed by Cars.	Murder and Manslaughter.	Suicide.	Execution (Hanging).	Other Violent Deaths.	Total Violent Deaths.		
2	3	6	4	11	10	6				17	33	5	153
				8	1					1	12	4	81
2	3	10		19	11	6				18	35	9	234
6		17	1	25		1		1		4	6		207
10	8	23		43									221
16	8	40	1	68		1		1		4	6		428
		32		39	8			2		6	16	8	265
	11	22		40	1					1	2	18	244
	11	54		79	9			2		7	18	26	509
36		53	11	148	10	1		1		14	26	30	762
14	31	53	3	130	2	1				3	6	30	724
50	31	106	14	278	12	2		1		17	32	60	1486
1		14	1	19	4					4	8	18	127
2	6	12	1	23	1						1	18	111
3	6	26	2	42	5					4	9	36	238
2		27		33	3	3		2		1	9		217
1	7	10		19				1		1	2	2	156
3	7	37		52	3	3		3		2	11	2	373
16		20	2	43	5	1				4	10	13	368
10	10	22	3	53	3			1			4	19	392
26	10	42	5	96	8	1		1		4	14	32	760
1		34	2	44	3	1				10	14	10	300
	5	30	1	40	2	1					3	18	256
1	5	64	3	84	5	2				10	17	28	556
3		26	1	37	7	1	3			6	17	6	282
1	17	41		62	3			1			4	22	299
4	17	67	1	99	10	1	3	1		6	21	28	581

TABLE F.—DEATHS BY COUNTIES—

COUNTIES.	CLASS I.—ZYMOTIC								
	Cholera Infantum.	Cholera Morbus.	Cynanche Trachealis (Membranous Croup).	Diarrhoea Acuta (Acute Diarrhoea).	Dysentaria Acuta (Acute Dysentery).	Diphtheria.	Erysipelas.	Febris Typhoides (Typhoid Fever).	Scarlatina (Scarlet Fever).
Haldimand :									
Males .....	1	.....	2	1	.....	2	.....	1	....
Females .....			4	4	.....			1	....
Total.....	1	.....	6	5	.....	7	.....	2	.....
Halton :									
Males .....	7	.....	.....	3	.....	7	2	2	.....
Females .....	4	.....	1	3	1	5	.....	1	2
Total.....	11	.....	1	6	1	12	2	3	2
Haliburton :									
Males .....	.....	.....	.....	.....	.....	6	.....	.....	.....
Females .....	.....	.....	.....	1	.....	8	.....	.....	.....
Total.....	.....	.....	.....	1	.....	14	.....	.....	.....
Hastings :									
Males .....	4	.....	10	2	.....	5	1	5	2
Females .....	.....	.....	5	1	.....	7	2	1	6
Total.....	4	.....	15	3	.....	12	3	6	8
Huron :									
Males .....	6	.....	4	8	6	2	1	8	...
Females .....	6	.....	.....	5	4	9	.....	4	1
Total.....	12	.....	4	13	10	11	1	12	1
Kent :									
Males .....	10	.....	11	11	1	19	4	3	1
Females .....	8	1	4	13	2	21	.....	3	2
Total.....	18	1	15	24	3	40	4	6	3
Lambton :									
Males .....	7	1	7	3	4	18	3	7	3
Females .....	4	.....	2	16	2	21	.....	6	1
Total.....	11	1	9	19	6	39	3	13	4
Lanark :									
Males .....	4	.....	7	4	2	10	.....	.....	12
Females .....	2	.....	4	4	.....	5	.....	3	12
Total.....	6	.....	11	8	2	15	.....	3	24
Leeds and Grenville :									
Males .....	4	1	5	11	.....	7	2	7	27
Females .....	3	.....	4	6	1	14	.....	2	20
Total.....	7	1	9	17	1	21	2	9	47

## CAUSES OF DEATHS.—Continued.

DISEASES.										CLASS II.—CONSTITUTIONAL DISEASES.				
Other Fevers.	Influenza.	Measles (Measles).	Whooping Cough.	Pyæmia.	Varicella (Small Pox).	Syphilis.	Alcoholism.	Other Zymotic Diseases.	Total Zymotic Diseases.	Anæmia.	Anasarca (General Dropsy).	Asthma.	Carcinoma (Cancer).	Rheumatism.
2				1					9	6	3		6	1
									15	4	6		7	1
2				1					24	10	9		13	2
1			1				1		24	7	1	1	4	1
	1	3	1	2					24	4	2		4	
1	1	3	2	2			1		48	11	3	1	8	1
								1	7	3	1			1
									9	2				
								1	16	5	1			1
5				1			1		36	19	7	2	3	3
6	3		2					1	34	12	7	2	1	
11	3		2	1			1	1	70	31	14	4	4	3
3				1					39	16	4	1	9	4
5			3	1				1	39	21	7		10	3
8			3	2				1	78	37	11	1	19	7
2			1	1			2		66	8	2	1	5	3
2	1		1	2				1	61	8	4		3	2
4	1		2	3			2	1	127	16	6	1	8	5
4	1	11	2	3					74	21	4		9	5
	1	5	2	2				1	68	17	8		6	2
4	2	16	4	5				1	137	38	12		15	7
	1		4	1				3	48	6	1	1	2	1
2	1	2	1	2					38	6	7		1	1
2	2	2	5	3				3	86	12	8	1	3	2
6		1	2					2	75	17	1	1	7	
8		1	4	1				4	68	18	6	2	6	2
14		2	6	1				6	143	35	7	3	13	2

TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS II.— <i>Continued.</i>					CLASS III.—			
	Hydrocephalus.	Phthisis (Consumption).	Scrofula.	Other Constitutional Dis- eases.	Total Constitutional Dis- eases.	Apoplexy.	Convulsions.	Encephalitis (Inflammation of Brain).	Epilepsy.
Haldimand :									
Males .....		6			22	1	2		
Females .....		12		1	31	1	1	4	1
Total .....		18		1	53	2	3	4	1
Halton :									
Males .....		11			25		5	5	
Females .....		13			23	1	4	2	1
Total .....		24			48	1	9	7	1
Haliburton :									
Males .....					5				
Females .....	1				3	1	1		
Total .....	1				8	1	1		
Hastings :									
Males .....		24		1	59	5	10	4	3
Females .....	10	38		4	74	4	5	8	1
Total .....	10	62		5	133	9	15	12	4
Huron :									
Males .....	3	29		1	67	7	9	9	1
Females .....	1	37		2	81	6	8	5	2
Total .....	4	66		3	148	13	17	14	3
Kent :									
Males .....	1	26			46	5	2	2	
Females .....		32			49	1	7	5	
Total .....	1	58			95	6	9	7	
Lambton :									
Males .....	1	21		4	65	3	7	5	1
Females .....	1	28		1	63	5	5	6	1
Total .....	2	49		5	128	8	12	11	2
Lanark :									
Males .....	6	13		2	32	4	4	6	
Females .....		27		1	43	3			
Total .....	6	40		3	75	7	4	6	
Leeds and Grenville :									
Males .....	2	44			72	5	6	4	1
Females .....		58			92	5	4	12	1
Total .....	2	102			164	10	10	16	2



CAUSES OF DEATHS, 1886.—*Continued.*

## LOCAL DISEASES.

Insanity.	Meningitis.	Neuroencephalus (Softening of Brain).	Paralysis (Palsy).	Valvular Disease of Heart.	Apoplexia Pulmonalis (Congestion of Lungs).	Bronchitis.	Laryngitis.	Pleurisy.	Pneumonia.	Dyspepsia.	Enteritis (Inflammation of Bowels).	Gastritis (Inflammation of Stomach).	Hepatitis (Inflammation of Liver).	Peritonitis (Inflammation of Abdomen).
.....	2	.....	6	7	2	2	.....	.....	9	3	4	.....	1	.....
.....	2	.....	8	5	3	1	.....	.....	8	.....	1	.....	1	.....
.....	4	.....	14	12	5	3	.....	.....	17	3	5	.....	2	.....
.....	1	1	5	5	4	1	1	.....	13	3	1	2	1	1
.....	.....	.....	4	9	3	3	.....	.....	10	4	1	3	.....	1
.....	1	1	9	14	7	4	1	.....	23	7	2	5	1	2
.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....
.....	.....	.....	1	2	.....	.....	.....	.....	1	.....	1	.....	.....	.....
.....	.....	.....	1	2	.....	.....	.....	1	2	.....	1	.....	.....	.....
...	2	1	5	11	6	6	3	.....	9	2	5	2	2	2
.....	.....	.....	4	10	13	4	.....	1	12	.....	3	1	.....	.....
.....	2	1	9	21	19	10	3	1	21	2	8	3	2	2
.....	2	1	7	24	6	7	.....	.....	18	1	8	4	2	.....
.....	3	.....	12	21	1	11	.....	.....	23	3	8	.....	1	2
.....	5	1	19	45	7	18	.....	.....	41	4	16	4	3	2
.....	2	.....	8	16	3	5	1	.....	24	1	11	2	.....	2
.....	1	1	6	24	5	4	.....	1	16	2	8	.....	1	2
.....	3	1	14	40	8	9	1	1	40	3	19	2	1	4
.....	2	.....	3	12	5	9	1	.....	17	2	6	.....	3	2
.....	2	.....	2	12	2	7	.....	.....	20	.....	5	2	1	3
.....	4	.....	5	24	7	16	1	.....	37	2	11	2	4	5
.....	3	1	2	10	3	7	.....	.....	15	3	3	.....	1	.....
.....	.....	.....	2	7	4	3	2	.....	15	.....	2	.....	.....	.....
.....	3	1	4	17	7	10	2	.....	30	3	5	.....	1	.....
.....	1	1	4	23	6	4	.....	1	16	2	12	5	.....	3
.....	1	.....	4	13	11	1	.....	1	16	1	9	1	1	1
.....	2	1	8	36	17	5	.....	2	32	3	21	6	1	4



TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS III.—Continued.							CLASS IV.	
	Cystitis (Inflammation of Bladder).	Diabetes.	Nephria (Bright's Disease).	Nephritis (Kidney Disease).	Abscess.	Other Local Diseases.	Total Local Diseases.	Dentitis (Teething).	Partus mortuus (Still Birth).
Haldimand :									
Males .....		2	2	2		3	48		
Females .....		1		1	1	2	41		
Total .....		3	2	3	1	5	89		
Halton :									
Males .....			3		2	2	56		
Females .....		1				4	51		2
Total .....		1	3		2	6	107		2
Haliburton :									
Males .....			1			1	4	1	1
Females .....				1			8		1
Total .....			1	1		1	12	1	2
Hastings :									
Males .....			2	4	1	8	93	2	4
Females .....		1		1	2	6	76		5
Total .....		1	2	5	3	14	169	2	9
Huron :									
Males .....	4	5			2	2	119	2	1
Females .....		1	2		2	8	119	1	2
Total .....	4	6	2		4	10	238	3	3
Kent :									
Males .....	2	3	3	1			93	3	3
Females .....		1	2	4		8	99	2	6
Total .....	2	4	5	5		8	192	5	9
Lambton :									
Males .....		3	1		6	7	95	1	2
Females .....			2	3		15	93		
Total .....		3	3	3	6	22	188	1	2
Lanark :									
Males .....	3	5	3	5			78	1	1
Females .....		1		1		4	44	1	2
Total .....	3	6	3	6		4	122	2	3
Leeds and Grenville :									
Males .....	3	1	3	3	5	9	118	1	1
Females .....			1	2		7	92	2	1
Total .....	3	1	4	5	5	16	210	3	2

CAUSES OF DEATH, 1886.—*Continued.*

—DEVELOPMENTAL DIS- EASES.					CLASS V.—VIOLENT DEATHS.								
Pertussis Intempestiva (Pre- mature Birth).	Diseases incidental to Child Birth.	Senectus (Old Age).	Other Developmental Dis- eases.	Total Developmental Dis- eases.	Vulnera (Wounds).	Killed by Cars.	Murder and Manslaughter.	Suicide.	Execution (Hanging).	Other Violent Deaths.	Total Violent Deaths.	Cause not specified.	Total Number of Deaths.
6	.....	14	.....	20	8	1	.....	.....	.....	3	12	5	116
2	7	11	.....	20	.....	.....	.....	.....	.....	.....	.....	2	109
2	7	25	.....	40	8	1	.....	.....	.....	3	12	7	225
1	.....	5	.....	6	3	.....	.....	2	.....	10	15	3	129
.....	1	8	1	12	.....	.....	.....	.....	.....	1	1	3	114
1	1	13	1	18	3	.....	.....	2	.....	11	16	6	243
.....	.....	.....	.....	2	1	.....	.....	.....	.....	.....	1	1	20
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	2	23
.....	.....	.....	.....	3	1	.....	.....	.....	.....	.....	1	3	43
2	.....	31	.....	39	4	2	.....	6	.....	7	19	10	256
2	5	25	.....	37	3	.....	.....	1	.....	1	5	12	241
4	5	56	.....	76	7	2	.....	7	.....	8	24	22	497
2	.....	29	1	35	.....	4	.....	.....	.....	.....	15	8	283
2	12	31	.....	48	2	.....	.....	.....	.....	.....	2	9	298
4	12	60	1	83	2	4	.....	.....	.....	.....	17	17	581
5	.....	27	.....	38	8	1	.....	1	.....	9	19	5	267
3	14	16	1	42	1	.....	.....	.....	.....	1	2	6	259
8	14	43	1	80	9	1	.....	1	.....	10	21	11	526
5	.....	13	.....	21	6	1	.....	1	.....	13	21	10	286
5	6	17	1	29	.....	.....	.....	1	.....	5	6	8	262
10	6	30	1	50	6	1	.....	2	.....	18	27	18	548
2	.....	24	1	29	2	.....	.....	.....	.....	5	7	5	199
.....	5	25	.....	33	.....	.....	.....	.....	.....	5	5	13	176
2	5	49	1	62	2	.....	.....	.....	.....	10	12	18	375
.....	.....	33	.....	35	4	.....	.....	2	.....	11	17	9	326
2	8	40	.....	53	2	1	.....	1	.....	4	8	15	328
2	8	73	.....	88	6	1	.....	3	.....	15	25	24	654

TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS I.—ZYMOTIC								
	Cholera Infantum.	Cholera Morbus.	Cynanche Trachealis (Membranous Croup).	Diarrhoea Acuta (Acute Diarrhoea).	Dysenteria Acuta (Acute Dysentery).	Diphtheria.	Erysipelas.	Febris Typhloides (Typhoid Fever).	Scarlatina (Scarlet Fever).
Lennox and Addington :									
Males .....	1			1		13		1	2
Females .....			1	1		9		3	3
Total .....	1		1	2		22		4	5
Lincoln :									
Males .....	8		1	3		3		6	
Females .....	11		2	6		6		3	1
Total .....	19		3	9		9		9	1
Middlesex :									
Males .....	11	1	6	14	4	27	3	16	3
Females .....	8	1	6	10	4	24	2	12	5
Total .....	19	2	12	24	8	51	5	28	8
Muskoka and Parry Sound :									
Males .....	2	1	2	3		10	1		
Females .....	2		4	3	2	18	1	1	
Total .....	4	1	6	6	2	28	2	1	
Norfolk :									
Males .....	2			8		6		12	
Females .....	3		3	4	2	2		4	1
Total .....	5		3	12	2	8		16	1
Northumberland and Durham :									
Males .....	4	1	3	8	2	9	4	3	10
Females .....	9			4		7	1	3	4
Total .....	13	1	3	12	2	16	5	6	14
Ontario :									
Males .....	12	1	5	4	2	7	1	7	
Females .....	5		2	4	2	9	2	6	
Total .....	17	1	7	8	4	16	3	13	
Oxford :									
Males .....	5		1	2	1	7	3	8	1
Females .....			4	3	2	7	1	9	
Total .....	5		5	5	3	14	4	17	1
Peel :									
Males .....			1	1	3	12	1	5	
Females .....	1				1	1	1	2	
Total .....	1		1	1	4	13	2	7	

CAUSES OF DEATHS, 1886.—*Continued.*

DISEASES.									CLASS II. — CONSTITUTIONAL DISEASES.					
Other Fevers.	Influenza.	Morbili (Measles).	Whooping Cough.	Pyæmia.	Varicella (Small Pox).	Syphilis.	Alcoholism.	Other Zymotic Diseases.	Total Zymotic Diseases.	Anæmia.	Anasarca (General Dropsy).	Asthma.	Carcinoma (Cancer).	Rheumatism.
1			3	1					20	5	3		1	
									20	3	2			3
1			3	1					40	8	5		1	3
2				1					24	15		1	8	1
1	1		1						32	7	3		4	1
3	1		1	1					56	22	3	1	12	2
1		1	1	3				3	94	43	7	3	7	2
7		3	1	3				1	87	21	11	2	13	3
8		4	2	6				4	181	64	18	5	20	5
2							1		22	10	3	1	1	1
3				1				4	39	23	5	1	2	
5				1			1	4	61	33	8	2	3	1
2	1		3					2	36	6	5	4	5	
6		1	2	2					30	4	2	3	4	1
8	1	1	5	2				2	66	10	7	7	9	1
	2		1	1				2	50	27	11		7	
3			4	2			1	1	39	16	7	4	6	8
3	2		5	3			1	3	89	43	18	4	13	8
		2	5	1					47	14	5		9	2
1			3						34	11	6		7	
1		2	8	1					81	25	11		16	2
1			2	1				1	33	17	4	2	8	1
1			2						29	19	4	2	10	4
2			4	1				1	62	36	8	4	18	5
	1							2	30	11	6		3	
		1	1	2					10	8	2		2	4
	1	1	3	4				2	40	19	8		5	4

TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS II.— <i>Continued</i> ,					CLASS III.—			
	Hydrocephalus.	Phthisis (Consumption).	Scrofula.	Other Constitutional Diseases.	Total Constitutional Diseases.	Apoplexy.	Convulsions.	Encephalitis (Inflammation of Brain).	Epilepsy.
Lennox and Addington :									
Males . . . . .	2	20			31	4	1	1	
Females . . . . .		15			23		2		1
Total . . . . .	2	35			54	4	3	1	1
Lincoln :									
Males . . . . .	2	27		1	55	5	7	3	1
Females . . . . .		27			42	6	5		2
Total . . . . .	2	54		1	97	11	12	3	3
Middlesex :									
Males . . . . .	4	49		2	117	17	13	9	3
Females . . . . .	4	60		2	116	11	10	9	1
Total . . . . .	8	109		4	233	28	23	18	4
Muskoka and Parry Sound :									
Males . . . . .	1	11			28		5	1	
Females . . . . .	1	10			42		9	5	
Total . . . . .	2	21			70		14	6	
Norfolk :									
Males . . . . .		15		2	37	5	9	3	1
Females . . . . .		28			42	1	3	2	2
Total . . . . .		43		2	79	6	12	5	3
Northumberland and Durham :									
Males . . . . .	3	41		2	91	5	5	6	1
Females . . . . .	2	50	1		94	5	4	6	3
Total . . . . .	5	91	1	2	185	10	9	12	4
Ontario :									
Males . . . . .	5	25		2	62	1	12	1	2
Females . . . . .	1	26		4	55	1	9	1	1
Total . . . . .	6	51		6	117	2	21	2	3
Oxford :									
Males . . . . .		20			52	4	10	1	1
Females . . . . .		38			77	2	8	1	2
Total . . . . .		58			129	6	18	2	3
Peel :									
Males . . . . .	1	8		1	30	2	1	2	
Females . . . . .	1	23			40	6	1	1	2
Total . . . . .	2	31		1	70	8	2	3	2



CAUSES OF DEATHS, 1886.—*Continued.*

LOCAL DISEASES.

Insanity.	Meningitis.	Neuroencephalus (Softening of Brain).	Paralysis (Palsy).	Valvular Disease of Heart.	Apoplexia Pulmonalis (Congestion of Lungs).	Bronchitis.	Laryngitis.	Pleurisy.	Pneumonia.	Dyspepsia.	Enteritis (Inflammation of Bowels).	Gastritis (Inflammation of Stomach).	Hepatitis (Inflammation of Liver).	Peritonitis (Inflammation of Abdomen).
		1	7	2					3		5	2	3	
	1		3	9	2				4		1	1	1	
	1	1	10	11	2				7		6	3	4	
	4		11	13	1	6	2		15		2	3	1	4
	1		6	12	2	5		1	16	3	2	1	1	3
	5		17	25	3	11	2	1	31	3	4	4	2	7
2	7		14	29	16	9			43	2	13	3	7	
	4	2	13	26	10	12			35	1	18	3	3	1
2	11	2	27	55	26	21			78	3	31	6	10	1
			1	9	5			1	14		2	1		
				5	3	2	1		10		7			
			1	14	8	2	1	1	24		9	1		
1	1		3	19	2	4			8	3	4	1	1	1
	3			11	5	1			15	3	2			1
1	4		3	21	7	5			23	6	6	1	1	2
		2	11	20	9	2			22		10		5	
	4		10	12	5	1	1	1	21		10	3	2	
	4	2	21	32	14	3	1	1	43		20	3	7	
	5		6	6	2	9		2	17	1	5		2	1
	7	1	5	8	3	6	1	1	10		6	1	3	3
	12	1	11	14	5	15	1	3	27	1	11	1	5	4
1		2	10	21	4	1	1	1	26	2	9	3	2	1
	1	2	7	18	5	5	1		26		5		1	1
1	1	4	17	39	9	6	2	1	52	2	14	3	3	2
			6	9	6	6			8	1	2			2
		1	8	6	3				13				1	1
		1	14	15	9	6			21	1	2		1	3



TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS III.— <i>Continued.</i>							CLASS IV.	
	Cystitis (Inflammation of Bladder).	Diabetes.	Nephria (Bright's Disease).	Nephritis (Kidney Disease).	Abscess.	Other Local Diseases.	Total Local Diseases.	Dentitio (Teething).	Partus Emortuus (Still-Birth).
Lennox and Addington :									
Males .....			1	1	1	3	35		
Females .....					1	4	30	1	
Total .....			1	1	2	7	65	1	
Lincoln :									
Males .....	1		3	1	2	7	92		9
Females .....		1				16	83	1	6
Total .....	1	1	3	1	2	23	175	1	15
Middlesex :									
Males .....	5	1		3	7	21	224	1	13
Females .....	1	1		2	1	10	174	6	9
Total .....	6	2		5	8	31	398	7	22
Muskoka and Parry Sound :									
Males .....			1		2	3	45		2
Females .....						3	45	2	3
Total .....			1		2	6	90	2	5
Norfolk :									
Males .....	2			2	1	5	67		1
Females .....		3	1	1		1	55		1
Total .....	2	3	1	3	1	6	122		2
Northumberland and Durham :									
Males .....	3		7	2	4	12	126		2
Females .....	1	2	3	1	2	15	112	1	
Total .....	4	2	10	3	6	27	238	1	2
Ontario :									
Males .....	2	1	7	1	2	8	93	1	1
Females .....		1		2	1	15	86		1
Total .....	2	2	7	3	3	23	179	1	2
Oxford :									
Males .....	2	3	2	6	3	2	118		
Females .....		2	1	2	1	2	93	2	3
Total .....	2	5	3	8	4	4	211	2	3
Peel :									
Males .....	1			2	1	2	51		2
Females .....			3			3	49		1
Total .....	1		3	2	1	5	100		3

CAUSES OF DEATHS, 1887.—*Continued.*

DEVELOPMENTAL DISEASES.					CLASS V.—VIOLENT DEATHS.							Cause not Specified.	Total Number of Deaths.
Fetus Intermittent (Pre-mature Birth).	Diseases incidental to Child-Birth.	Senectus (Old Age).	Other Developmental Diseases.	Total Developmental Diseases.	Vulnera (Wounds).	Killed by Cars.	Murder and Manslaughter.	Suicide.	Execution (Hanging).	Other Violent Deaths.	Total Violent Deaths.		
.....	6	13 11	1 1	14 19	2	2	.....	1	.....	3	8	7 2	115 94
.....	6	24	2	33	2	2	.....	1	.....	3	8	9	200
5	.....	22	3	39	5	1	.....	.....	.....	7	13	2	225
.....	9	19	.....	35	.....	.....	1	1	.....	4	6	8	206
5	9	41	3	74	5	1	1	1	.....	11	19	10	431
7 12	..... 13	52 44	5 .....	58 84	10 1	1 .....	.....	4 .....	.....	5 5	20 6	18 23	551 490
19	13	96	5	162	11	1	.....	4	.....	10	26	41	1041
1 5	..... 9	10 10	1 1	14 30	9 1	2 .....	.....	1 .....	.....	11 2	23 3	3 10	135 169
6	9	20	2	44	10	2	.....	1	.....	13	26	13	304
1 2	..... 5	14 22	..... 3	16 33	.....	.....	.....	2 .....	.....	.....	2	1 3	159 163
3	5	36	3	49	.....	.....	.....	2	.....	.....	2	4	322
2 1	..... 7	47 45	2 .....	53 54	6 2	3 .....	.....	2 .....	.....	13 3	24 5	8 18	352 322
3	7	92	2	107	8	3	.....	2	.....	16	29	26	674
1 9	..... 8	32 21	1 3	36 42	..... 2	1 .....	.....	1 .....	.....	2 3	4 5	3 6	245 226
10	8	53	4	78	2	1	.....	1	.....	5	9	9	473
4 7	..... 14	25 25	2 4	31 55	11 2	1 .....	.....	3 .....	.....	3 .....	18 2	3 8	255 264
11	14	50	6	86	13	1	.....	3	.....	3	20	11	519
.....	.....	18	.....	20	8	.....	.....	1	.....	2	11	3	145
.....	11	25	.....	37	2	.....	.....	.....	.....	2	4	11	151
.....	11	43	.....	57	10	.....	.....	1	.....	4	15	14	296

TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS I.—ZYMOTIC								
	Cholera Infantum.	Cholera Morbus.	Cynanche Trachealis (Membranous Croup).	Diarrhoea Acuta (Acute Diarrhoea).	Dysentery Acuta (Acute Dysentery).	Diphtheria.	Erysipelas.	Febris Typhoides (Typhoid Fever).	Scarlatina (Scarlet Fever).
Perth :									
Males .....	5	2	3	8	3	4	1	7	3
Females.....	5	.....	3	5	3	9	.....	9	5
Total .....	10	2	6	13	6	13	1	16	8
Peterborough :									
Males .....	2	3	.....	10	1	12	.....	2	3
Females.....	2	.....	1	8	1	9	2	2	3
Total .....	4	3	1	18	2	21	2	4	6
Prescott and Russell :									
Males .....	1	.....	18	1	.....	81	.....	1	1
Females.....	.....	.....	19	4	1	78	.....	1	2
Total .....	1	.....	37	5	1	159	.....	2	3
Prince Edward :									
Males .....	2	.....	3	.....	.....	4	.....	3	2
Females .....	2	1	1	.....	.....	5	2	2	3
Total .....	4	1	4	.....	.....	9	2	5	5
Renfrew :									
Males .....	4	.....	6	5	.....	25	2	2	.....
Females.....	1	.....	9	2	2	39	1	1	3
Total .....	5	.....	15	7	2	64	3	3	3
Simcoe :									
Males .....	1	1	3	10	.....	28	.....	5	3
Females.....	2	1	1	8	1	23	.....	2	2
Total .....	3	2	4	18	1	51	.....	7	5
Stormont, Dundas and Glengarry :									
Males .....	4	.....	8	16	2	20	3	2	10
Females.....	5	.....	3	5	2	25	1	5	2
Total .....	9	.....	11	21	4	45	4	7	12
Victoria :									
Males .....	3	.....	.....	.....	2	5	.....	.....	.....
Females.....	3	1	3	2	1	8	1	2	2
Total .....	6	1	3	2	3	13	1	2	2
Waterloo :									
Males .....	13	1	7	9	.....	7	1	3	.....
Females.....	8	.....	8	17	.....	9	2	.....	.....
Total .....	21	1	15	26	.....	16	3	3	.....

CAUSES OF DEATH, 1886.—*Continued.*

DISEASES.										CLASS II.—CONSTITUTIONAL DISEASES.				
Other Fevers.	Influenza.	Morbili (Measles).	Whooping Cough.	Pyæmia.	Variola (Small Pox).	Syphilis.	Alcoholism.	Other Zymotic Diseases.	Total Zymotic Diseases.	Anæmia.	Anasarca (General Dropsy).	Asthma.	Carcinoma (Cancer).	Rheumatism.
4 2	2 2	4 2	2 3	2 2	.....	.....	.....	2 .....	50 50	17 14	3 7	3 .....	4 2	1 1
6	2	6	5	4	.....	.....	.....	2	100	31	10	3	6	2
3 5	..... 1	..... .....	..... 1	..... .....	..... .....	..... .....	1 .....	1 1	38 36	11 7	..... 2	2 .....	1 6	..... 1
8	1	.....	1	.....	.....	.....	1	2	74	18	2	2	7	1
2 5	2 1	1 1	5 10	..... 2	2 1	..... .....	..... .....	1 1	116 126	69 71	2 2	1 2	3 1	..... 1
7	3	2	15	2	3	.....	.....	2	242	140	4	3	4	1
2	.....	3	1	.....	.....	.....	.....	1	14 23	10 4	3 5	..... 1	1 2	..... 3
2	.....	3	1	.....	.....	.....	.....	1	37	14	8	1	3	3
3 6	..... .....	..... 1	7 4	..... 1	1 .....	..... .....	..... .....	2 2	57 72	23 15	4 3	1 2	7 2	2 1
9	.....	1	11	1	1	.....	.....	4	129	38	7	3	9	3
6 2	1 2	..... .....	5 3	..... 1	..... .....	..... .....	..... .....	2 2	65 50	23 23	5 5	..... .....	3 4	..... 3
8	3	.....	8	1	.....	.....	.....	4	115	46	10	.....	7	3
2 4	..... .....	..... .....	6 8	..... .....	..... .....	..... .....	..... .....	2 1	75 61	22 22	7 8	..... 1	9 4	3 3
6	.....	.....	14	.....	.....	.....	.....	3	136	44	15	1	13	6
3 1	..... 1	1 .....	2 .....	1 .....	..... .....	..... .....	..... .....	1 1	18 26	9 9	1 3	1 .....	6 1	..... 2
4	1	1	2	1	.....	.....	.....	2	44	18	4	1	7	2
4 4	1 .....	..... .....	2 2	1 1	1 .....	..... .....	1 .....	..... 2	51 53	12 15	9 10	2 1	2 4	1 2
8	1	.....	4	2	1	.....	1	2	104	27	19	3	6	3

TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS II.—Continued.					CLASS III.—			
	Hydrocephalus.	Phthisis (Consumption).	Scrofula.	Other Constitutional Diseases.	Total Constitutional Diseases.	Apoplexy.	Convulsions.	Encephalitis, (Inflammation of Brain).	Epilepsy.
Perth :									
Males .....	2	25			55	6	9	5	.....
Females .....		25			49	3	7	8	1
Total .....	2	50			104	9	16	13	1
Peterborough :									
Males .....	1	11			26	3	7	4	.....
Females .....		18		1	35	4	6	2	.....
Total .....	1	29		1	61	7	13	6	.....
Prescott and Russell :									
Males .....		21			96	.....	1	4	.....
Females .....		20			97	3	4	2	.....
Total .....		41			193	3	5	6	.....
Prince Edward :									
Males .....	1	17		1	33	2	3	2	2
Females .....		24			39	1	2	2	.....
Total .....	1	41		1	72	3	5	4	2
Renfrew :									
Males .....	1	12			50	1	2	5	.....
Females .....	3	29		1	56	1	1	4	.....
Total .....	4	41		1	106	2	3	9	.....
Simcoe :									
Males .....	4	26			61	3	13	3	.....
Females .....	5	32		2	74	.....	8	3	1
Total .....	9	58		2	135	3	21	6	1
Stormont, Dundas and Glengarry :									
Males .....	2	32			75	1	5	5	1
Females .....	4	51			93	2	4	1	.....
Total .....	6	83			168	3	9	6	1
Victoria :									
Males .....	2	13		2	34	5	7	6	.....
Females .....		20		1	36	3	3	4	.....
Total .....	2	33		3	70	8	10	10	.....
Waterloo :									
Males .....	3	22	1		52	6	12	4	.....
Females .....		27			59	9	14	1	2
Total .....	3	49	1		111	15	26	5	2



CAUSES OF DEATH, 1886.—*Continued.*

## LOCAL DISEASES.

Insanity.	Meningitis.	Neuroencephalus (Softening of the Brain).	Paralysis (Palsy).	Valvular Disease of Heart.	Apoplexia Pulmonat's (Congestion of Lungs).	Bronchitis.	Laryngitis.	Pleurisy.	Pneumonia.	Dyspepsia.	Enteritis (Inflammation of Bowels).	Gastritis (Inflammation of Stomach).	Hepatitis (Inflammation of Liver).	Peritonitis (Inflammation of Abdomen)
.....	2	.....	5	14	3	13	.....	1	28	.....	3	1	.....	.....
.....	.....	.....	5	12	5	5	.....	2	27	1	11	1	.....	3
.....	2	.....	10	26	12	18	....	3	55	1	14	2	..	3
.....	.....	.....	5	4	1	3	.....	.....	20	4	7	2	.....	.....
.....	1	1	2	5	.....	1	.....	.....	13	1	5	2	2	1
.....	1	1	7	9	1	4	.....	.....	33	5	12	4	2	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	1	4	3	2	3	1	1	4	2	4	.....	.....	.....
.....	.....	.....	1	10	5	3	1	.....	7	.....	.....	1	.....	.....
.....	1	1	5	13	7	6	2	1	11	2	4	1	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	1	2	3	11	1	2	.....	.....	8	.....	7	3	.....	3
1	.....	.....	.....	7	.....	7	.....	.....	1	1	1	1	2	1
1	1	2	3	18	1	9	.....	.....	9	1	8	4	2	4
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	1	2	7	7	2	2	.....	7	1	4	1	1	.....
.....	.....	.....	2	3	1	2	.....	.....	7	1	4	2	.....	.....
.....	.....	1	4	10	8	4	2	.....	14	2	8	3	1	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	2	.....	7	4	5	8	1	.....	18	2	10	4	1	.....
.....	.....	2	10	23	5	12	2	.....	12	2	9	.....	3	.....
.....	2	2	17	27	10	20	3	.....	30	4	19	4	4	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	8	3	3	7	.....	1	13	1	3	.....	3	.....
.....	.....	.....	5	11	6	5	.....	2	16	.....	7	2	4	3
.....	.....	.....	13	14	9	12	.....	3	29	1	10	2	7	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	3	.....	7	6	2	4	.....	.....	12	.....	5	1	2	3
1	1	.....	1	7	4	1	.....	3	9	.....	8	.....	.....	1
1	4	.....	8	13	6	5	.....	3	21	.....	13	1	2	4
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	2	.....	4	11	2	12	2	.....	27	1	6	2	5	.....
1	.....	.....	4	11	1	6	.....	1	22	1	9	3	1	4
1	2	.....	8	22	3	18	2	1	49	2	15	5	6	4



TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS III.—Continued.							CLASS IV.	
	Cystitis (Inflammation of Bladder).	Diabetes.	Nephria (Bright's Disease).	Nephritis (Kidney Disease).	Abscess.	Other Local Diseases.	Total Local Diseases.	Dentitia (Teething).	Partus Emortus (Still Birth).
Perth :									
Males .....	3	1	3	2	1	11	115	2	2
Females .....			1	2	1	5	100	2	2
Total .....	3	1	4	4	2	16	215	4	5
Peterborough :									
Males .....	2		2	1		4	69	1	2
Females .....			1	2		9	58	1	1
Total .....	2		3	3		13	127	2	3
Prescott and Russell :									
Males .....	1				2	8	42	5	9
Females .....					1	1	39	4	3
Total .....	1				3	9	81	9	12
Prince Edward :									
Males .....	1	1	2		1	1	56		3
Females .....		1		2	1	4	35		1
Total .....	1	2	2	2	2	5	91		4
Renfrew :									
Males .....		4		1	1	11	57	1	
Females .....			2	1		4	38		2
Total .....		4	2	2	1	15	95	1	2
Simcoe :									
Males .....		2	2	2	1	7	95	4	4
Females .....		2	1	3	3	7	108	1	1
Total .....		4	3	5	4	14	203	5	5
Stormont, Dundas and Glengarry :									
Males .....		1	3	5		7	70	2	2
Females .....				1	2	5	76	2	2
Total .....		1	3	6	2	12	146	4	4
Victoria :									
Males .....	2		1		2	4	72		4
Females .....	1		1	1		5	54		5
Total .....	3		2	1	2	9	126		9
Waterloo :									
Males .....	1		3	5	1	5	111	2	5
Females .....			1		3	8	102	1	3
Total .....	1		4	5	4	13	213	3	8

CAUSES OF DEATHS, 1886.—Continued.

—DEVELOPMENTAL DIS-EASES.					CLASS V.—VIOLENT DEATHS.							Cause not specified.	Total Number of Deaths.
Fetus Intempestivus (Pre-mature Birth).	Diseases incidental to Child-Birth.	Senectus (Old Age).	Other Developmental Dis-eases.	Total Developmental Dis-eases.	Vulnere (Wounds).	Killed by Cars.	Murder and Manslaughter.	Suicide.	Execution (Hanging).	Other Violent Deaths.	Total Violent Deaths.		
4	.....	30	2	41	9	1	.....	.....	.....	3	13	7	281
4	4	28	1	41	1	.....	.....	1	.....	.....	2	14	256
8	4	58	3	82	10	1	.....	1	.....	3	15	21	537
1	.....	13	1	18	3	1	.....	1	.....	5	10	2	163
2	6	13	2	25	1	.....	.....	.....	.....	.....	1	3	158
3	6	26	3	43	4	1	.....	1	.....	5	11	5	321
2	.....	22	.....	38	6	.....	.....	1	.....	2	9	19	329
2	6	23	1	39	1	1	.....	.....	.....	1	3	44	348
4	6	45	1	77	7	1	.....	1	.....	3	12	63	668
2	.....	18	.....	23	2	.....	.....	.....	.....	2	4	9	139
1	5	19	3	29	.....	.....	.....	1	.....	.....	1	16	143
3	5	37	3	52	2	.....	.....	1	.....	2	5	25	282
2	.....	23	.....	26	7	1	.....	.....	.....	5	13	7	210
4	6	17	4	33	2	1	.....	.....	.....	1	4	10	213
6	6	40	4	59	9	2	.....	.....	.....	6	17	17	423
2	.....	33	.....	43	12	1	1	2	.....	6	22	13	299
2	9	29	5	47	1	.....	.....	.....	.....	1	2	7	288
4	9	62	5	90	13	1	1	2	.....	7	24	20	587
1	.....	34	.....	39	5	.....	.....	1	.....	4	10	11	286
3	6	47	.....	60	1	.....	.....	.....	.....	2	3	16	309
4	6	81	.....	99	6	.....	.....	1	.....	6	13	27	589
1	.....	13	4	22	5	1	.....	.....	.....	2	8	1	155
.....	4	12	.....	21	.....	.....	.....	.....	.....	4	4	.....	141
1	4	25	4	43	5	1	.....	.....	.....	6	12	1	296
1	.....	33	.....	41	4	2	.....	.....	.....	5	11	4	270
.....	7	25	2	38	.....	.....	.....	1	.....	3	4	10	266
1	7	58	2	79	4	2	.....	1	.....	8	15	14	536

TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS I.—ZYMOTIC								
	Cholera Infantum.	Cholera Morbus.	Cynanche Trachealis (Membranous Croup).	Diarrhoea Acuta (Acute Diarrhoea).	Dysenteria Acuta (Acute Dysentery).	Diphtheria.	Erysipelas.	Febris Typhoides (Typhoid Fever).	Scarlatina (Scarlet Fever).
Welland :									
Males .....	6	.....	1	3	2	9	1	5	.....
Females .....	2	.....	2	3	1	5	.....	5	.....
Total .....	8	.....	3	6	3	14	1	10	.....
Wellington :									
Males .....	5	1	5	6	1	13	2	5	3
Females .....	4	.....	2	5	2	6	2	5	1
Total .....	9	1	7	11	3	19	4	10	4
Wentworth :									
Males .....	21	1	6	27	3	64	5	13	2
Females .....	17	.....	11	15	6	53	2	8	1
Total .....	38	1	17	42	9	117	7	21	3
York :									
Males .....	60	3	38	61	6	123	8	41	7
Females .....	43	1	29	39	8	105	7	26	14
Total .....	103	4	67	100	14	228	15	67	21
Total Males .....	264	21	226	316	51	704	67	221	131
“ Females .....	201	9	201	287	62	702	35	165	129
Grand Total .....	465	30	427	603	113	1406	102	386	260

CAUSES OF DEATHS, 1886.—*Continued.*

DISEASES.										CLASS II.— CONSTITUTIONAL DISEASES.				
Other Fevers.	Influenza.	Morbilli (Measles).	Whooping Cough.	Pyæmia.	Varicella (Small Pox).	Syphilis.	Alcoholism.	Other Zymotic Diseases.	Total Zymotic Diseases.	Anæmia.	Anasarca (General Dropsy).	Asthma.	Carcinoma (Cancer).	Rheumatism.
3	.....	1	.....	1	.....	.....	1	.....	33	3	1	1	5	4
3	.....	.....	.....	.....	.....	1	.....	.....	22	3	2	.....	6	.....
6	.....	1	.....	1	.....	1	1	.....	55	6	3	1	11	4
.....	1	1	2	1	.....	.....	1	1	48	25	5	1	6	3
1	1	2	3	2	.....	.....	.....	.....	36	24	7	3	7	2
1	2	3	5	3	.....	.....	1	1	84	49	12	4	13	5
3	.....	.....	2	5	.....	1	.....	3	156	30	1	2	12	2
3	.....	1	5	5	.....	1	.....	1	129	29	2	1	21	1
6	.....	1	7	10	.....	2	.....	4	285	59	3	3	33	3
9	1	34	8	4	1	5	3	9	421	135	11	7	22	10
6	.....	23	14	7	.....	1	.....	12	335	113	16	1	30	4
15	1	57	22	11	1	6	3	21	756	248	27	8	52	14
99	15	75	88	39	8	7	16	53	2401	873	153	57	221	71
116	20	74	117	50	11	7	1	51	2238	791	205	34	219	72
215	35	149	205	89	19	14	17	104	4639	1664	358	91	440	143

TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS II.— <i>Continued.</i>					CLASS III.—			
	Hydrocephalus.	Phthisis (Consumption).	Serofula.	Other Constitutional Diseases.	Total Constitutional Diseases.	Apoplexy.	Convulsions.	Encephalitis (Inflammation of Brain).	Epilepsy.
Welland :									
Males .....	1	17		1	33	5	5	4	
Females .....	1	25		1	38		4	4	
Total .....	2	42		2	71	5	9	8	
Wellington :									
Males .....	2	32			74	3	12	5	1
Females .....	1	42		2	88	8	10	8	1
Total .....	3	74		2	162	11	22	13	2
Wentworth :									
Males .....	3	53		6	109	9	11	10	1
Females .....	2	84	2	7	149	14	15	8	1
Total .....	5	137	2	13	258	23	26	18	2
York :									
Males .....	11	164	1	40	401	37	80	12	8
Females .....	6	172	1	37	380	26	74	11	8
Total .....	17	336	2	77	781	63	154	23	16
Total Males .....	84	1065	12	77	2613	189	346	166	36
" Females .....	53	1354	22	75	2825	156	276	163	40
Grand Total .....	137	2419	34	152	5438	345	622	329	76

CAUSES OF DEATHS, 1886.—*Continued.*

## LOCAL DISEASES.

Insanity.	Meningitis.	Neuroencephalus (Softening of Brain).	Paralysis (Palsy).	Valvular Disease of Heart.	Apoplexia Pulmonalis (Congestion of Lungs).	Bronchitis.	Laryngitis.	Pleurisy.	Pneumonia.	Dyspepsia.	Enteritis (Inflammation of Bowels).	Gastritis (Inflammation of Stomach.)	Hepatitis (Inflammation of Liver).	Peritonitis (Inflammation of Abdomen).
.....	1	.....	8	14	2	1	.....	.....	7	1	2	1	1	1
.....	2	.....	3	10	3	2	.....	.....	5	.....	3	.....	1	.....
.....	3	.....	11	24	5	3	.....	.....	12	1	5	1	2	1
.....	3	.....	13	13	14	16	1	.....	36	1	9	.....	3	.....
1	2	.....	7	24	11	12	.....	1	23	.....	6	3	2	.....
1	5	.....	20	37	25	28	1	1	59	1	15	3	5	.....
7	18	3	7	29	5	10	3	2	58	.....	14	6	7	4
5	11	6	11	25	12	15	2	.....	37	1	16	5	8	9
13	29	9	18	54	17	25	5	2	95	1	30	11	15	13
2	39	6	31	69	37	60	6	9	135	3	37	13	9	8
2	41	5	26	68	33	47	4	6	104	1	16	13	12	22
4	80	11	57	137	70	107	10	15	239	4	53	26	21	30
14	128	30	275	546	212	266	26	28	820	54	268	77	81	51
14	97	26	232	544	201	232	20	25	687	30	248	66	61	76
28	225	56	507	1070	413	498	46	53	1507	84	516	143	142	127



TABLE F.—DEATHS BY COUNTIES.—

COUNTIES.	CLASS III.— <i>Continued.</i>							CLASS IV.	
	Cystitis (Inflammation of Bladder)	Diabetes.	Nephria (Bright's Disease).	Nephritis (Kidney Disease).	Abscess.	Other Diseases.	Total Local Diseases.	Dentitia (Teething).	Partus Emortuus (Still Birth).
Welland :									
Males . . . . .			2	1	2	2	60	1	2
Females . . . . .						2	39	.....	4
Total . . . . .			2	1	2	4	99	1	6
Wellington :									
Males . . . . .	3	4	5	3	2	16	163	4	13
Females . . . . .		1	4	.....	2	6	132	3	10
Total . . . . .	3	5	9	3	4	22	295	7	23
Wentworth :									
Males . . . . .			11	6	7	17	246	2	29
Females . . . . .		2	6	1	2	13	225	.....	18
Total . . . . .		2	17	7	9	30	471	2	47
York :									
Males . . . . .	9	5	14	14	18	11	672	4	79
Females . . . . .	1	3	19	17	12	70	641	5	67
Total . . . . .	10	8	33	31	30	81	1313	9	146
Total Males . . . . .	52	54	101	97	94	282	4293	73	251
" Females . . . . .	5	30	59	65	54	314	3721	64	193
Grand Total . . . . .	57	84	160	162	148	596	8014	137	444

CAUSES OF DEATHS, 1886.—*Concluded.*

—DEVELOPMENTAL DIS-EASES.					CLASS V.—VIOLENT DEATHS.								
Partus Interuentivus (Pre-mature Birth).	Diseases incidental to Child-Birth.	Senectus (Old Age).	Other Developmental Dis-eases.	Total Developmental Dis-eases.	Vulnera (Wounds).	Killed by Cars.	Murder and Manslaughter.	Suicide.	Execution (Hanging).	Other Violent Deaths.	Total Violent Deaths.	Cause not specified.	Total Number of Deaths.
.....	.....	24	1	28	3	4	1	1	.....	3	12	6	172
1	4	15	1	25	2	.....	1	1	.....	3	7	4	135
1	4	39	2	53	5	4	2	2	.....	6	19	10	307
3	.....	37	1	58	9	1	.....	.....	.....	4	14	17	374
3	8	37	5	66	1	.....	.....	.....	.....	1	2	4	328
6	8	74	6	124	10	1	.....	.....	.....	5	16	21	702
13	.....	46	4	94	15	.....	.....	1	.....	6	22	.....	627
6	12	40	2	78	2	.....	.....	.....	.....	2	4	12	597
19	12	86	6	172	17	.....	.....	1	.....	8	26	12	1224
37	.....	118	21	259	30	4	.....	3	.....	38	75	59	1887
40	33	122	14	281	6	.....	.....	1	.....	21	28	34	1699
77	33	240	35	540	36	4	.....	4	.....	59	103	93	3586
180	.....	1082	69	1655	252	50	5	43	.....	261	611	349	11922
158	348	1039	63	1865	49	5	2	12	.....	81	149	464	11262
338	348	2121	132	3520	301	55	7	55	.....	342	760	813	23184

H. S. CREWE,  
*Inspector.*

TABLE C.—CITIES.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.

TORONTO.—POPULATION, 118,403.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.														
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.
Males ..	1	1	1	1	1	1	19	12	4	1	1	1	39	34	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Females ..	1	1	1	1	1	2	18	12	2	1	1	1	37	31	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Males ..	5	5	5	5	3	1	1	1	1	5	3	4	38	3	20	15	15	15	15	15	15	15	15	15	15	15	15	15
Females ..	7	4	2	5	2	2	1	2	1	1	1	2	30	3	21	6	6	6	6	6	6	6	6	6	6	6	6	6
Males ..	1	2	2	1	1	3	17	12	18	3	1	1	60	40	12	1	1	1	1	1	1	1	1	1	1	1	1	1
Females ..	1	1	2	2	2	6	14	11	8	1	1	1	46	22	4	9	4	4	4	4	4	4	4	4	4	4	4	4
Males ..	13	8	10	10	5	5	3	4	6	5	5	10	81	10	50	12	7	1	2	2	2	2	2	2	2	2	2	2
Females ..	9	14	9	12	6	5	5	5	4	5	10	9	93	12	41	20	13	4	1	1	1	1	1	1	1	1	1	1
Males ..	2	2	8	2	2	2	2	2	2	8	2	2	32	1	3	3	2	6	7	5	3	1	2	1	1	1	1	1
Females ..	3	4	1	2	2	2	1	1	4	1	1	1	22	2	1	1	1	2	3	5	1	1	1	1	1	1	1	1
Males ..	1	1	1	1	1	1	1	1	1	1	1	1	5	1	4	4	2	1	1	1	1	1	1	1	1	1	1	1
Females ..	4	1	1	2	1	1	1	1	1	1	1	1	10	1	6	2	1	1	1	1	1	1	1	1	1	1	1	1
Males ..	1	1	1	3	1	1	1	1	1	1	1	1	12	3	5	5	1	1	2	1	1	1	1	1	1	1	1	1
Females ..	1	1	1	1	1	1	1	1	1	1	1	1	5	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Males ..	6	6	4	18	8	1	1	1	1	1	1	1	37	16	16	4	4	1	1	1	1	1	1	1	1	1	1	1
Females ..	2	2	5	11	5	1	1	1	1	1	1	1	24	5	18	1	1	1	1	1	1	1	1	1	1	1	1	1
Males ..	1	1	2	2	3	1	1	1	1	1	2	1	7	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Females ..	1	3	2	2	3	1	1	1	1	1	1	1	14	8	6	1	1	1	1	1	1	1	1	1	1	1	1	1
Males ..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Females ..	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Males ..	13	7	15	11	15	8	17	17	16	10	4	2	135	106	14	1	3	1	5	3	2	5	5	5	5	5	5	5
Females ..	11	8	10	14	11	4	17	11	12	7	5	6	116	87	9	1	1	1	5	3	3	4	4	4	4	4	4	4











TABLE C.—CITIES.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—*Continued.*  
 OTTAWA.—POPULATION, 34,857.

SEX.		MONTHS.												CAUSE OF DEATH.	AGES.													
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.
Males ..	...	...	...	2	...	...	...	8	1	4	1	...	1	17	11	6	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	1	...	...	...	...	5	1	1	1	...	...	9	7	2	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	1	2	...	1	1	...	...	...	1	1	1	1	...	9	2	7	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	1	1	...	...	1	...	...	1	2	1	1	3	2	13	1	9	1	2	...	...	...	...	...	...	...	...	...	...
Males ..	1	...	1	...	3	3	6	3	7	3	6	2	1	30	18	6	3	1	1	1	...	1	...	...	...	...	...	...
Females ..	4	1	2	1	1	2	3	11	8	6	6	6	1	46	27	10	1	4	1	...	...	...	...	...	...	...	...	...
Males ..	1	...	...	...	1	1	...	...	6	3	...	...	3	15	2	10	3	...	...	...	...	...	...	...	...	...	...	...
Females ..	5	5	3	1	...	1	3	...	...	4	2	2	2	23	1	12	8	1	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	4	3	...	...	...	7	...	...	...	...	1	2	2	...	...	...	...	...	...	...
Females ..	1	1	...	...	...	...	...	...	...	2	1	...	...	5	...	1	...	...	1	1	...	...	...	...	...	...	...	...
Males ..	...	1	...	1	1	...	...	...	1	1	...	...	...	4	...	3	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	1	...	...	...	...	...	...	1	...	...	...	4	1	2	...	1	...	...	...	...	...	...	...	...	...	...
Males ..	1	1	...	2	1	2	1	...	...	...	1	2	...	10	3	2	1	...	2	2	...	...	...	...	...	...	...	...
Females ..	...	1	...	...	1	...	2	...	...	...	2	...	...	6	1	...	1	1	2	1	...	...	...	...	...	...	...	...
Males ..	2	...	1	4	7	1	...	...	...	1	...	...	...	16	5	6	5	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	2	3	6	1	1	...	...	...	...	...	...	14	4	9	...	1	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	1	2	...	...	...	4	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	1	...	...	...	...	...	1	1	...	...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	1	...	...	...	...	...	...	...	...	...	...	...	...	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	2	4	...	...	...	...	...	...	...	...	...	...	...	10	...	3	...	3	2	...	...	...	...	...	...	...	...	...
Males ..	9	6	5	17	7	4	7	3	3	...	8	6	75	59	9	3	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	10	4	8	...	6	4	4	4	4	6	2	4	68	54	8	1	...	1	1	...	...	...	...	...	...	...	...	...

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Males ..	2	...	...	...	1	...	...	1	2	7	...	...	...	1	...	...	...	1	1	...	...	1	...
Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	3	...	...	...	1	...	...	...	2	13	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	3	1	2	...	...	...	...	4	...	41	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	7	10	11	7	...	...	...	1	...	55	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	9	4	3	4	...	...	...	5	4	55	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	3	3	1	1	...	...	...	3	...	34	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	1	4	2	2	...	...	...	1	4	17	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	1	2	4	1	...	...	...	1	...	26	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	3	3	6	12	2	...	...	1	3	47	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	9	5	2	5	2	...	...	3	...	40	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	4	1	1	2	1	...	...	1	3	18	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	1	2	...	2	1	...	...	...	...	14	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	2	...	...	...	...	...	...	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	3	...	...	...	...	...	...	...	...	11	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	1	...	...	...	...	...	...	...	...	23	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	1	6	3	2	4	...	...	1	3	30	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	2	1	1	...	...	...	...	...	...	17	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	1	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	16	15	11	15	11	...	...	...	...	15	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	13	7	5	8	15	...	...	...	...	13	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	55	44	36	63	52	41	45	24	61	59	580	...	...	...	...	...	...	...	...	...	...	...	...
Total	60	57	49	43	56	21	31	32	41	42	520	...	...	...	...	...	...	...	...	...	...	...	...
Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Grand Total	115	101	85	106	108	62	79	56	102	93	101	1100	...	...	...	...	...	...	...	...	...	...	...

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TABLE G.—CITIES.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—*Continued.*

LONDON.—Population, 26,047.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.														
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.
Males ..	...	...	...	...	...	...	...	5	3	...	...	...	8	7	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	3	...	1	...	...	4	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	2	1	1	4	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	1	1	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	1	3	...	...	...	...	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	2	2	...	...	...	...	7	4	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	2	...	...	5	...	1	4	12	1	2	8	1	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	1	...	...	1	1	2	2	7	...	4	3	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	1	1	5	...	2	...	8	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	1	1	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	2	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	3	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	1	1	1	2	1	2	4	1	1	1	2	...	15	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	1	1	...	1	1	...	8	6	2	...	...	...	...	...	...	...	...	...	...	...	...	...





TABLE G.—CITIES.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—Continued.

KINGSTON.—Population, 15,827.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.														
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	3	{	Cholera Infantum. ....	...	...	...	...	...	...	...	...	...	...	...	...	...
Females	...	...	...	...	...	...	...	3	...	...	...	...	2			...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	1	1	1	1	1	1	1	...	1	1	...	2	5	{	Group. ....	...	5	4	...	...	...	...	...	...	...	...	...	...
Females	...	...	...	...	...	...	...	3	...	...	...	...	6			...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	1	1	1	1	2	1	1	...	...	4	{	Diarrhoea and Dysentery. ....	4	...	...	...	...	...	1	...	...	...	...	...	
Females	...	...	...	1	1	...	...	1	1	1	...	...	5			...	...	4	...	...	...	...	...	...	...	...	...	...
Males ..	1	1	1	1	1	...	...	...	...	...	...	1	4	{	Diphtheria. ....	...	...	1	1	...	...	...	...	...	...	...	...	
Females	2	...	...	...	...	...	...	...	...	...	...	...	5			...	...	...	2	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	2	...	...	...	...	...	...	...	2	{	Typhoid Fever. ....	...	...	...	1	...	...	...	...	...	...	...	...	
Females	...	...	...	...	...	...	...	...	...	...	...	...	...			...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	2	1	1	1	1	...	...	...	1	...	...	...	5	{	Scarlet Fever. ....	...	1	3	1	...	...	...	...	...	...	...	...	
Females	3	1	1	1	1	...	...	...	...	...	...	...	7			...	...	5	2	...	...	...	...	...	...	...	...	...
Males ..	...	1	...	...	1	...	...	...	...	...	...	...	1	{	Other Fevers. ....	...	1	...	...	...	...	...	...	...	...	...	...	
Females	...	...	1	...	...	...	...	...	...	...	1	...	3			...	...	...	1	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	{	Measles. ....	...	...	...	...	...	...	...	...	...	...	...	...	
Females	...	...	...	...	...	...	...	...	...	...	...	...	...			...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	1	1	...	2	1	1	1	...	...	3	{	Whooping Cough. ....	2	1	...	...	...	...	...	...	...	...	...	...	
Females	...	...	...	...	...	...	...	1	1	1	...	...	6			...	...	4	2	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	{	Small Pox. ....	...	...	...	...	...	...	...	...	...	...	...	...	
Females	...	...	...	...	...	...	...	...	...	...	...	...	...			...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	2	3	1	1	...	...	...	1	1	1	...	...	9	{	Anæmia, including Infantile Debility. ....	6	2	...	...	...	...	...	...	...	...	...	...	
Females	2	1	1	1	2	...	...	1	...	1	...	...	10			...	...	6	1	...	...	...	...	...	...	...	...	...













TABLE G.—CITIES.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—*Continued.*  
GUELPH.—POPULATION, 10,216.

SEX.		MONTHS.												CAUSE OF DEATH.	AGES.														
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.
Males	Females	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	1	1	...	...	...	...	...	...	...	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	1	2	1	...	...	4	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	1	...	1	...	...	...	...	...	...	...	...	3	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	2	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	1	2	1	...	2	1	1	1	...	...	...	10	10	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males	Females	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...







TABLE G.—CITIES.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—*Continued.*

ST. CATHARINES.—POPULATION, 9,779.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.													
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.
Males ..	...	...	...	1	...	...	...	2	1	...	...	...	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	1	...	...	...	3	3	1	...	...	8	7	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	1	...	...	1	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	2	1	3	2	...	1	1	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	1	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	1	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	10	7	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	1	2	...	2	...	1	1	4	2	...	...	5	3	...	...	...	...	...	...	...	...	...	...	1	...	...

CXVI.

[illegible]













TABLE G.—CITIES.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.

RECAPITULATION.

MONTHS.												CAUSE OF DEATH.	Total.	AGES.													
January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.
1	1	3	2	1	4	58	72	25	8	2	3	Cholera Infantum	180	145	35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
16	17	14	14	8	6	3	7	5	14	13	14	Croup	131	11	88	28	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	
7	4	7	7	5	15	54	75	65	20	9	4	Diarrhea and Dysentery	272	177	40	15	9	2	4	2	5	4	3	6	3	2	
37	42	32	31	20	26	18	16	28	29	24	52	Diphtheria	355	27	179	103	28	8	3	2	.....	1	.....	.....	.....	4	
8	5	10	5	8	5	1	4	22	22	11	8	Typhoid Fever	109	3	6	6	7	14	24	22	8	5	2	.....	7		
10	5	5	6	4	3	2	3	2	2	1	.....	Scarlet Fever	43	3	25	10	4	1	.....	.....	.....	.....	.....	.....	.....	.....	
3	5	6	6	4	5	4	3	2	2	6	5	Other Fevers	51	10	16	6	4	7	5	.....	1	1	1	.....	.....		
2	8	12	36	27	5	1	.....	1	3	2	.....	Measles	97	31	53	10	1	1	.....	.....	.....	.....	.....	.....	.....	.....	
3	3	9	7	6	1	3	5	6	4	3	2	Whooping Cough	52	36	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
4	4	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	Small Pox.	12	.....	3	1	3	2	1	.....	.....	.....	.....	.....	.....	2	
55	39	53	56	55	25	67	55	54	34	29	30	(Anemia, including Infantile Debility	552	430	52	5	3	4	9	4	12	15	14	2	2	.....	
8	1	7	1	5	7	4	10	6	5	5	4	Dropsy	63	4	3	3	3	3	4	4	7	10	9	6	.....	4	
9	16	8	8	13	12	15	10	13	17	13	11	Cancer	145	2	2	3	.....	3	17	30	27	32	26	2	.....	1	
63	63	65	53	55	47	47	47	53	50	42	57	Phthisis	642	32	52	17	9	51	210	114	62	46	23	16	4	.....	6
48	77	61	57	51	64	65	60	73	43	51	57	(Nervous Diseases, including Convulsions	707	245	102	29	11	13	31	40	38	35	71	63	22	2	5
34	32	24	35	25	20	19	18	20	23	31	30	Heart Diseases	311	23	9	12	9	10	25	37	42	42	45	45	11	.....	1

83	70	76	99	74	44	36	24	30	49	55	56	696	Pneumonia . . . . .	164	159	25	12	12	38	46	52	58	50	49	22	1	8
21	14	17	24	9	13	22	29	27	14	21	7	218	Enteritis and Gastritis . . . . .	77	22	11	3	5	23	19	9	24	10	9	3	...	3
5	8	5	1	8	7	5	8	5	6	4	7	69	Liver Diseases . . . . .	1	2	1	1	...	4	6	14	15	10	11	3	...	1
9	14	9	8	14	11	18	16	9	7	10	13	138	Kidney Diseases . . . . .	6	2	2	7	3	13	16	14	26	24	14	8	1	2
3	11	3	2	12	2	4	2	4	1	7	4	55	Child Birth . . . . .	...	...	...	...	4	23	24	2	...	...	...	...	...	2
29	26	32	31	26	26	31	27	26	14	26	39	333	Old Age . . . . .	...	...	...	...	...	...	...	...	...	...	162	135	35	1
11	9	11	11	10	13	16	13	14	10	7	8	133	Violent Deaths . . . . .	6	13	12	4	9	21	7	19	9	13	8	4	...	8
...	...	1	1	...	1	1	...	...	4	...	2	10	Suicide . . . . .	...	...	...	...	1	1	1	5	...	...	1	...	...	1
80	72	78	98	113	80	80	69	74	79	68	83	971	{ Other diseases and cause not specified . . . . . }	583	111	21	19	20	34	26	39	37	33	13	6	1	31
549	546	552	599	553	442	574	573	564	460	440	496	6348		2016	990	320	141	170	476	387	355	352	344	437	231	40	89

















TABLE C.—TOWNS.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—*Continued.*

GODERICH.—Population, 3,927.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.													
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Cholera Infantum ....	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Croup .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Diarrhoea and Dysentery....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Diphtheria .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Typhoid Fever .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Scarlet Fever .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Other Fevers .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Measles .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Whooping Cough....	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	1	...	Anaemia, including Infantile Debility...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	1	...	...	...	...	...	...	...	...	...	...	Dropsey .....	1	...	...	...	...	...	...	...	...	...	...	1	...	...
Females ..	1	...	...	...	...	...	...	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...

CXXX



TABLE C.—TOWNS.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—Continued.

CHATHAM.—POPULATION, 8,457.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.														
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.
Males ..	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	3	1	...	...	...	...	...	...	1	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	1	1	1	...	1	...	...	2	1	...	...	1	4	...	3	...	1	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	4	...	1	3	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	1	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	2	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...















TABLE G.—TOWNS.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—*Continued.*

NAPANEE.—POPULATION, 3,414.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.														
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.
Males ..													1	1														
Females ..								1																				
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TABLE G.—TOWNS.—DEATHS BY AGES, MONTHS AND DISEASES, 1886. *Continued.*

BROCKVILLE.—POPULATION, 8,320.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.														
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.
Males ..	...	...	...	...	1	...	...	1	...	...	...	...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	1	1	...	...	...	...	...	...	...	...	...	...	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	...	...	...	...	1	4	1	...	...	...	6	3	2	...	...	...	...	...	...	1	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	1	...	1	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	...	...	...	...	...	...	1	...	...	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	1	1	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	1	...	...	...	...	...	...	...	...	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	2	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	2	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	1	...	...	...	2	...	...	...	...	...	...	1	...	3	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	2	1	...	...	...	...	2	...	...	...	...	...	5	4	...	...	...	...	...	...	...	...	1	...	...	...	...	
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	1	...	...	...	...	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	



















TABLE G.—TOWNS.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—*Continued.*  
WOODSTOCK.—POPULATION, 6,718.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.													
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...











TABLE C.—TOWNS.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—*Continued.*  
 PETERBOROUGH.—POPULATION, 8,149.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.														
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.		Total.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and over.	Unknown.
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	10	3	1	1	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	9	6	2	1	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	7	1	5	1	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	1	...	...	...	1	...	...	...	...	...	...	...	...	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...











[illegible]



















TABLE C.—TOWNS.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—*Continued.*  
 BERLIN.—POPULATION, 5,343.

SEX.	MONTHS.												AGES.	CAUSE OF DEATH.	Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.			
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.																			
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	Total.	Cholera Infantum. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	...	...	...	...	...	...	...	...	1	1	1	Croup. ....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	...	...	...	...	...	...	1	...	...	...	1	Diarrhoea and Dysentery ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	Diphtheria. ....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	1	...	...	...	...	...	...	...	1	Typhoid Fever. ....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	Scarlet Fever. ....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	Other Fevers. ....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	Measles. ....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	Whooping Cough. ....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	1	...	1	1	...	...	...	3	Anæmia, including Infantile Debility ...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	1	...	...	1	...	...	1	1	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Males ..	...	...	...	...	...	...	1	...	...	1	...	...	1	Dropsy. ....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Females ..	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

[illegible]

TABLE G.—TOWNS.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.—Continued.

GALT.—Population, 6,322.

SEX.	MONTHS.												CAUSE OF DEATH.	AGES.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.			December.	Total.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
Males ..	...	...	...	...	...	...	...	...	...	...	...	...	...	{ Cholera Infantum.... {	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...













Males .. Females ..	2 <sup>d</sup>	3 <sup>d</sup>	4 <sup>d</sup>	5 <sup>d</sup>	6 <sup>d</sup>	7 <sup>d</sup>	8 <sup>d</sup>	9 <sup>d</sup>	10 <sup>d</sup>	11 <sup>d</sup>	12 <sup>d</sup>	13 <sup>d</sup>	14 <sup>d</sup>	15 <sup>d</sup>	16 <sup>d</sup>	17 <sup>d</sup>	18 <sup>d</sup>	19 <sup>d</sup>	20 <sup>d</sup>	21 <sup>d</sup>	22 <sup>d</sup>	23 <sup>d</sup>	24 <sup>d</sup>	25 <sup>d</sup>	26 <sup>d</sup>	27 <sup>d</sup>	28 <sup>d</sup>	29 <sup>d</sup>	30 <sup>d</sup>	31 <sup>d</sup>	32 <sup>d</sup>	33 <sup>d</sup>	34 <sup>d</sup>	35 <sup>d</sup>	36 <sup>d</sup>	37 <sup>d</sup>	38 <sup>d</sup>	39 <sup>d</sup>	40 <sup>d</sup>	41 <sup>d</sup>	42 <sup>d</sup>	43 <sup>d</sup>	44 <sup>d</sup>	45 <sup>d</sup>	46 <sup>d</sup>	47 <sup>d</sup>	48 <sup>d</sup>	49 <sup>d</sup>	50 <sup>d</sup>	51 <sup>d</sup>	52 <sup>d</sup>	53 <sup>d</sup>	54 <sup>d</sup>	55 <sup>d</sup>	56 <sup>d</sup>	57 <sup>d</sup>	58 <sup>d</sup>	59 <sup>d</sup>	60 <sup>d</sup>	61 <sup>d</sup>	62 <sup>d</sup>	63 <sup>d</sup>	64 <sup>d</sup>	65 <sup>d</sup>	66 <sup>d</sup>	67 <sup>d</sup>	68 <sup>d</sup>	69 <sup>d</sup>	70 <sup>d</sup>	71 <sup>d</sup>	72 <sup>d</sup>	73 <sup>d</sup>	74 <sup>d</sup>	75 <sup>d</sup>	76 <sup>d</sup>	77 <sup>d</sup>	78 <sup>d</sup>	79 <sup>d</sup>	80 <sup>d</sup>	81 <sup>d</sup>	82 <sup>d</sup>	83 <sup>d</sup>	84 <sup>d</sup>	85 <sup>d</sup>	86 <sup>d</sup>	87 <sup>d</sup>	88 <sup>d</sup>	89 <sup>d</sup>	90 <sup>d</sup>	91 <sup>d</sup>	92 <sup>d</sup>	93 <sup>d</sup>	94 <sup>d</sup>	95 <sup>d</sup>	96 <sup>d</sup>	97 <sup>d</sup>	98 <sup>d</sup>	99 <sup>d</sup>	100 <sup>d</sup>	101 <sup>d</sup>	102 <sup>d</sup>	103 <sup>d</sup>	104 <sup>d</sup>	105 <sup>d</sup>	106 <sup>d</sup>	107 <sup>d</sup>	108 <sup>d</sup>	109 <sup>d</sup>	110 <sup>d</sup>	111 <sup>d</sup>	112 <sup>d</sup>	113 <sup>d</sup>	114 <sup>d</sup>	115 <sup>d</sup>	116 <sup>d</sup>	117 <sup>d</sup>	118 <sup>d</sup>	119 <sup>d</sup>	120 <sup>d</sup>	121 <sup>d</sup>	122 <sup>d</sup>	123 <sup>d</sup>	124 <sup>d</sup>	125 <sup>d</sup>	126 <sup>d</sup>	127 <sup>d</sup>	128 <sup>d</sup>	129 <sup>d</sup>	130 <sup>d</sup>	131 <sup>d</sup>	132 <sup>d</sup>	133 <sup>d</sup>	134 <sup>d</sup>	135 <sup>d</sup>	136 <sup>d</sup>	137 <sup>d</sup>	138 <sup>d</sup>	139 <sup>d</sup>	140 <sup>d</sup>	141 <sup>d</sup>	142 <sup>d</sup>	143 <sup>d</sup>	144 <sup>d</sup>	145 <sup>d</sup>	146 <sup>d</sup>	147 <sup>d</sup>	148 <sup>d</sup>	149 <sup>d</sup>	150 <sup>d</sup>	151 <sup>d</sup>	152 <sup>d</sup>	153 <sup>d</sup>	154 <sup>d</sup>	155 <sup>d</sup>	156 <sup>d</sup>	157 <sup>d</sup>	158 <sup>d</sup>	159 <sup>d</sup>	160 <sup>d</sup>	161 <sup>d</sup>	162 <sup>d</sup>	163 <sup>d</sup>	164 <sup>d</sup>	165 <sup>d</sup>	166 <sup>d</sup>	167 <sup>d</sup>	168 <sup>d</sup>	169 <sup>d</sup>	170 <sup>d</sup>	171 <sup>d</sup>	172 <sup>d</sup>	173 <sup>d</sup>	174 <sup>d</sup>	175 <sup>d</sup>	176 <sup>d</sup>	177 <sup>d</sup>	178 <sup>d</sup>	179 <sup>d</sup>	180 <sup>d</sup>	181 <sup>d</sup>	182 <sup>d</sup>	183 <sup>d</sup>	184 <sup>d</sup>	185 <sup>d</sup>	186 <sup>d</sup>	187 <sup>d</sup>	188 <sup>d</sup>	189 <sup>d</sup>	190 <sup>d</sup>	191 <sup>d</sup>	192 <sup>d</sup>	193 <sup>d</sup>	194 <sup>d</sup>	195 <sup>d</sup>	196 <sup>d</sup>	197 <sup>d</sup>	198 <sup>d</sup>	199 <sup>d</sup>	200 <sup>d</sup>	201 <sup>d</sup>	202 <sup>d</sup>	203 <sup>d</sup>	204 <sup>d</sup>	205 <sup>d</sup>	206 <sup>d</sup>	207 <sup>d</sup>	208 <sup>d</sup>	209 <sup>d</sup>	210 <sup>d</sup>	211 <sup>d</sup>	212 <sup>d</sup>	213 <sup>d</sup>	214 <sup>d</sup>	215 <sup>d</sup>	216 <sup>d</sup>	217 <sup>d</sup>	218 <sup>d</sup>	219 <sup>d</sup>	220 <sup>d</sup>	221 <sup>d</sup>	222 <sup>d</sup>	223 <sup>d</sup>	224 <sup>d</sup>	225 <sup>d</sup>	226 <sup>d</sup>	227 <sup>d</sup>	228 <sup>d</sup>	229 <sup>d</sup>	230 <sup>d</sup>	231 <sup>d</sup>	232 <sup>d</sup>	233 <sup>d</sup>	234 <sup>d</sup>	235 <sup>d</sup>	236 <sup>d</sup>	237 <sup>d</sup>	238 <sup>d</sup>	239 <sup>d</sup>	240 <sup>d</sup>	241 <sup>d</sup>	242 <sup>d</sup>	243 <sup>d</sup>	244 <sup>d</sup>	245 <sup>d</sup>	246 <sup>d</sup>	247 <sup>d</sup>	248 <sup>d</sup>	249 <sup>d</sup>	250 <sup>d</sup>	251 <sup>d</sup>	252 <sup>d</sup>	253 <sup>d</sup>	254 <sup>d</sup>	255 <sup>d</sup>	256 <sup>d</sup>	257 <sup>d</sup>	258 <sup>d</sup>	259 <sup>d</sup>	260 <sup>d</sup>	261 <sup>d</sup>	262 <sup>d</sup>	263 <sup>d</sup>	264 <sup>d</sup>	265 <sup>d</sup>	266 <sup>d</sup>	267 <sup>d</sup>	268 <sup>d</sup>	269 <sup>d</sup>	270 <sup>d</sup>	271 <sup>d</sup>	272 <sup>d</sup>	273 <sup>d</sup>	274 <sup>d</sup>	275 <sup>d</sup>	276 <sup>d</sup>	277 <sup>d</sup>	278 <sup>d</sup>	279 <sup>d</sup>	280 <sup>d</sup>	281 <sup>d</sup>	282 <sup>d</sup>	283 <sup>d</sup>	284 <sup>d</sup>	285 <sup>d</sup>	286 <sup>d</sup>	287 <sup>d</sup>	288 <sup>d</sup>	289 <sup>d</sup>	290 <sup>d</sup>	291 <sup>d</sup>	292 <sup>d</sup>	293 <sup>d</sup>	294 <sup>d</sup>	295 <sup>d</sup>	296 <sup>d</sup>	297 <sup>d</sup>	298 <sup>d</sup>	299 <sup>d</sup>	300 <sup>d</sup>	301 <sup>d</sup>	302 <sup>d</sup>	303 <sup>d</sup>	304 <sup>d</sup>	305 <sup>d</sup>	306 <sup>d</sup>	307 <sup>d</sup>	308 <sup>d</sup>	309 <sup>d</sup>	310 <sup>d</sup>	311 <sup>d</sup>	312 <sup>d</sup>	313 <sup>d</sup>	314 <sup>d</sup>	315 <sup>d</sup>	316 <sup>d</sup>	317 <sup>d</sup>	318 <sup>d</sup>	319 <sup>d</sup>	320 <sup>d</sup>	321 <sup>d</sup>	322 <sup>d</sup>	323 <sup>d</sup>	324 <sup>d</sup>	325 <sup>d</sup>	326 <sup>d</sup>	327 <sup>d</sup>	328 <sup>d</sup>	329 <sup>d</sup>	330 <sup>d</sup>	331 <sup>d</sup>	332 <sup>d</sup>	333 <sup>d</sup>	334 <sup>d</sup>	335 <sup>d</sup>	336 <sup>d</sup>	337 <sup>d</sup>	338 <sup>d</sup>	339 <sup>d</sup>	340 <sup>d</sup>	341 <sup>d</sup>	342 <sup>d</sup>	343 <sup>d</sup>	344 <sup>d</sup>	345 <sup>d</sup>	346 <sup>d</sup>	347 <sup>d</sup>	348 <sup>d</sup>	349 <sup>d</sup>	350 <sup>d</sup>	351 <sup>d</sup>	352 <sup>d</sup>	353 <sup>d</sup>	354 <sup>d</sup>	355 <sup>d</sup>	356 <sup>d</sup>	357 <sup>d</sup>	358 <sup>d</sup>	359 <sup>d</sup>	360 <sup>d</sup>	361 <sup>d</sup>	362 <sup>d</sup>	363 <sup>d</sup>	364 <sup>d</sup>	365 <sup>d</sup>	366 <sup>d</sup>	367 <sup>d</sup>	368 <sup>d</sup>	369 <sup>d</sup>	370 <sup>d</sup>	371 <sup>d</sup>	372 <sup>d</sup>	373 <sup>d</sup>	374 <sup>d</sup>	375 <sup>d</sup>	376 <sup>d</sup>	377 <sup>d</sup>	378 <sup>d</sup>	379 <sup>d</sup>	380 <sup>d</sup>	381 <sup>d</sup>	382 <sup>d</sup>	383 <sup>d</sup>	384 <sup>d</sup>	385 <sup>d</sup>	386 <sup>d</sup>	387 <sup>d</sup>	388 <sup>d</sup>	389 <sup>d</sup>	390 <sup>d</sup>	391 <sup>d</sup>	392 <sup>d</sup>	393 <sup>d</sup>	394 <sup>d</sup>	395 <sup>d</sup>	396 <sup>d</sup>	397 <sup>d</sup>	398 <sup>d</sup>	399 <sup>d</sup>	400 <sup>d</sup>	401 <sup>d</sup>	402 <sup>d</sup>	403 <sup>d</sup>	404 <sup>d</sup>	405 <sup>d</sup>	406 <sup>d</sup>	407 <sup>d</sup>	408 <sup>d</sup>	409 <sup>d</sup>	410 <sup>d</sup>	411 <sup>d</sup>	412 <sup>d</sup>	413 <sup>d</sup>	414 <sup>d</sup>	415 <sup>d</sup>	416 <sup>d</sup>	417 <sup>d</sup>	418 <sup>d</sup>	419 <sup>d</sup>	420 <sup>d</sup>	421 <sup>d</sup>	422 <sup>d</sup>	423 <sup>d</sup>	424 <sup>d</sup>	425 <sup>d</sup>	426 <sup>d</sup>	427 <sup>d</sup>	428 <sup>d</sup>	429 <sup>d</sup>	430 <sup>d</sup>	431 <sup>d</sup>	432 <sup>d</sup>	433 <sup>d</sup>	434 <sup>d</sup>	435 <sup>d</sup>	436 <sup>d</sup>	437 <sup>d</sup>	438 <sup>d</sup>	439 <sup>d</sup>	440 <sup>d</sup>	441 <sup>d</sup>	442 <sup>d</sup>	443 <sup>d</sup>	444 <sup>d</sup>	445 <sup>d</sup>	446 <sup>d</sup>	447 <sup>d</sup>	448 <sup>d</sup>	449 <sup>d</sup>	450 <sup>d</sup>	451 <sup>d</sup>	452 <sup>d</sup>	453 <sup>d</sup>	454 <sup>d</sup>	455 <sup>d</sup>	456 <sup>d</sup>	457 <sup>d</sup>	458 <sup>d</sup>	459 <sup>d</sup>	460 <sup>d</sup>	461 <sup>d</sup>	462 <sup>d</sup>	463 <sup>d</sup>	464 <sup>d</sup>	465 <sup>d</sup>	466 <sup>d</sup>	467 <sup>d</sup>	468 <sup>d</sup>	469 <sup>d</sup>	470 <sup>d</sup>	471 <sup>d</sup>	472 <sup>d</sup>	473 <sup>d</sup>	474 <sup>d</sup>	475 <sup>d</sup>	476 <sup>d</sup>	477 <sup>d</sup>	478 <sup>d</sup>	479 <sup>d</sup>	480 <sup>d</sup>	481 <sup>d</sup>	482 <sup>d</sup>	483 <sup>d</sup>	484 <sup>d</sup>	485 <sup>d</sup>	486 <sup>d</sup>	487 <sup>d</sup>	488 <sup>d</sup>	489 <sup>d</sup>	490 <sup>d</sup>	491 <sup>d</sup>	492 <sup>d</sup>	493 <sup>d</sup>	494 <sup>d</sup>	495 <sup>d</sup>	496 <sup>d</sup>	497 <sup>d</sup>	498 <sup>d</sup>	499 <sup>d</sup>	500 <sup>d</sup>	501 <sup>d</sup>	502 <sup>d</sup>	503 <sup>d</sup>	504 <sup>d</sup>	505 <sup>d</sup>	506 <sup>d</sup>	507 <sup>d</sup>	508 <sup>d</sup>	509 <sup>d</sup>	510 <sup>d</sup>	511 <sup>d</sup>	512 <sup>d</sup>	513 <sup>d</sup>	514 <sup>d</sup>	515 <sup>d</sup>	516 <sup>d</sup>	517 <sup>d</sup>	518 <sup>d</sup>	519 <sup>d</sup>	520 <sup>d</sup>	521 <sup>d</sup>	522 <sup>d</sup>	523 <sup>d</sup>	524 <sup>d</sup>	525 <sup>d</sup>	526 <sup>d</sup>	527 <sup>d</sup>	528 <sup>d</sup>	529 <sup>d</sup>	530 <sup>d</sup>	531 <sup>d</sup>	532 <sup>d</sup>	533 <sup>d</sup>	534 <sup>d</sup>	535 <sup>d</sup>	536 <sup>d</sup>	537 <sup>d</sup>	538 <sup>d</sup>	539 <sup>d</sup>	540 <sup>d</sup>	541 <sup>d</sup>	542 <sup>d</sup>	543 <sup>d</sup>	544 <sup>d</sup>	545 <sup>d</sup>	546 <sup>d</sup>	547 <sup>d</sup>	548 <sup>d</sup>	549 <sup>d</sup>	550 <sup>d</sup>	551 <sup>d</sup>	552 <sup>d</sup>	553 <sup>d</sup>	554 <sup>d</sup>	555 <sup>d</sup>	556 <sup>d</sup>	557 <sup>d</sup>	558 <sup>d</sup>	559 <sup>d</sup>	560 <sup>d</sup>	561 <sup>d</sup>	562 <sup>d</sup>	563 <sup>d</sup>	564 <sup>d</sup>	565 <sup>d</sup>	566 <sup>d</sup>	567 <sup>d</sup>	568 <sup>d</sup>	569 <sup>d</sup>	570 <sup>d</sup>	571 <sup>d</sup>	572 <sup>d</sup>	573 <sup>d</sup>	574 <sup>d</sup>	575 <sup>d</sup>	576 <sup>d</sup>	577 <sup>d</sup>	578 <sup>d</sup>	579 <sup>d</sup>	580 <sup>d</sup>	581 <sup>d</sup>	582 <sup>d</sup>	583 <sup>d</sup>	584 <sup>d</sup>	585 <sup>d</sup>	586 <sup>d</sup>	587 <sup>d</sup>	588 <sup>d</sup>	589 <sup>d</sup>	590 <sup>d</sup>	591 <sup>d</sup>	592 <sup>d</sup>	593 <sup>d</sup>	594 <sup>d</sup>	595 <sup>d</sup>	596 <sup>d</sup>	597 <sup>d</sup>	598 <sup>d</sup>	599 <sup>d</sup>	600 <sup>d</sup>	601 <sup>d</sup>	602 <sup>d</sup>	603 <sup>d</sup>	604 <sup>d</sup>	605 <sup>d</sup>	606 <sup>d</sup>	607 <sup>d</sup>	608 <sup>d</sup>	609 <sup>d</sup>	610 <sup>d</sup>	611 <sup>d</sup>	612 <sup>d</sup>	613 <sup>d</sup>	614 <sup>d</sup>	615 <sup>d</sup>	616 <sup>d</sup>	617 <sup>d</sup>	618 <sup>d</sup>	619 <sup>d</sup>	620 <sup>d</sup>	621 <sup>d</sup>	622 <sup>d</sup>	623 <sup>d</sup>	624 <sup>d</sup>	625 <sup>d</sup>	626 <sup>d</sup>	627 <sup>d</sup>	628 <sup>d</sup>	629 <sup>d</sup>	630 <sup>d</sup>	631 <sup>d</sup>	632 <sup>d</sup>	633 <sup>d</sup>	634 <sup>d</sup>	635 <sup>d</sup>	636 <sup>d</sup>	637 <sup>d</sup>	638 <sup>d</sup>	639 <sup>d</sup>	640 <sup>d</sup>	641 <sup>d</sup>	642 <sup>d</sup>	643 <sup>d</sup>	644 <sup>d</sup>	645 <sup>d</sup>	646 <sup>d</sup>	647 <sup>d</sup>	648 <sup>d</sup>	649 <sup>d</sup>	650 <sup>d</sup>	651 <sup>d</sup>	652 <sup>d</sup>	653 <sup>d</sup>	654 <sup>d</sup>	655 <sup>d</sup>	656 <sup>d</sup>	657 <sup>d</sup>	658 <sup>d</sup>	659 <sup>d</sup>	660 <sup>d</sup>	661 <sup>d</sup>	662 <sup>d</sup>	663 <sup>d</sup>	664 <sup>d</sup>	665 <sup>d</sup>	666 <sup>d</sup>	667 <sup>d</sup>	668 <sup>d</sup>	669 <sup>d</sup>	670 <sup>d</sup>	671 <sup>d</sup>	672 <sup>d</sup>	673 <sup>d</sup>	674 <sup>d</sup>	675 <sup>d</sup>	676 <sup>d</sup>	677 <sup>d</sup>	678 <sup>d</sup>	679 <sup>d</sup>	680 <sup>d</sup>	681 <sup>d</sup>	682 <sup>d</sup>	683 <sup>d</sup>	684 <sup>d</sup>	685 <sup>d</sup>	686 <sup>d</sup>	687 <sup>d</sup>	688 <sup>d</sup>	689 <sup>d</sup>	690 <sup>d</sup>	691 <sup>d</sup>	692 <sup>d</sup>	693 <sup>d</sup>	694 <sup>d</sup>	695 <sup>d</sup>	696 <sup>d</sup>	697 <sup>d</sup>	698 <sup>d</sup>	699 <sup>d</sup>	700 <sup>d</sup>	701 <sup>d</sup>	702 <sup>d</sup>	703 <sup>d</sup>	704 <sup>d</sup>	705 <sup>d</sup>	706 <sup>d</sup>	707 <sup>d</sup>	708 <sup>d</sup>	709 <sup>d</sup>	710 <sup>d</sup>	711 <sup>d</sup>	712 <sup>d</sup>	713 <sup>d</sup>	714 <sup>d</sup>	715 <sup>d</sup>	716 <sup>d</sup>	717 <sup>d</sup>	718 <sup>d</sup>	719 <sup>d</sup>	720 <sup>d</sup>	721 <sup>d</sup>	722 <sup>d</sup>	723 <sup>d</sup>	724 <sup>d</sup>	725 <sup>d</sup>	726 <sup>d</sup>	727 <sup>d</sup>	728 <sup>d</sup>	729 <sup>d</sup>	730 <sup>d</sup>	731 <sup>d</sup>	732 <sup>d</sup>	733 <sup>d</sup>	734 <sup>d</sup>	735 <sup>d</sup>	736 <sup>d</sup>	737 <sup>d</sup>	738 <sup>d</sup>	739 <sup>d</sup>	740 <sup>d</sup>	741 <sup>d</sup>	742 <sup>d</sup>	743 <sup>d</sup>	744 <sup>d</sup>	745 <sup>d</sup>	746 <sup>d</sup>	747 <sup>d</sup>	748 <sup>d</sup>	749 <sup>d</sup>	750 <sup>d</sup>	751 <sup>d</sup>	752 <sup>d</sup>	753 <sup>d</sup>	754 <sup>d</sup>	755 <sup>d</sup>	756 <sup>d</sup>	757 <sup>d</sup>	758 <sup>d</sup>	759 <sup>d</sup>	760 <sup>d</sup>	761 <sup>d</sup>	762 <sup>d</sup>	763 <sup>d</sup>	764 <sup>d</sup>	765 <sup>d</sup>	766 <sup>d</sup>	767 <sup>d</sup>	768 <sup>d</sup>	769 <sup>d</sup>	770 <sup>d</sup>	771 <sup>d</sup>	772 <sup>d</sup>	773 <sup>d</sup>	774 <sup>d</sup>	775 <sup>d</sup>	776 <sup>d</sup>	777 <sup>d</sup>	778 <sup>d</sup>	779 <sup>d</sup>	780 <sup>d</sup>	781 <sup>d</sup>	782 <sup>d</sup>	783 <sup>d</sup>	784 <sup>d</sup>	785 <sup>d</sup>	786 <sup>d</sup>	787 <sup>d</sup>	788 <sup>d</sup>	789 <sup>d</sup>	790 <sup>d</sup>	791 <sup>d</sup>	792 <sup>d</sup>	793 <sup>d</sup>	794 <sup>d</sup>	795 <sup>d</sup>	796 <sup>d</sup>	797 <sup>d</sup>	798 <sup>d</sup>	799 <sup>d</sup>	800 <sup>d</sup>	801 <sup>d</sup>	802 <sup>d</sup>	803 <sup>d</sup>	804 <sup>d</sup>	805 <sup>d</sup>	806 <sup>d</sup>	807 <sup>d</sup>	808 <sup>d</sup>	809 <sup>d</sup>	810 <sup>d</sup>	811 <sup>d</sup>	812 <sup>d</sup>	813 <sup>d</sup>	814 <sup>d</sup>	815 <sup>d</sup>	816 <sup>d</sup>	817 <sup>d</sup>	818 <sup>d</sup>	819 <sup>d</sup>	820 <sup>d</sup>	821 <sup>d</sup>	822 <sup>d</sup>	823 <sup>d</sup>	824 <sup>d</sup>	825 <sup>d</sup>	826 <sup>d</sup>	827 <sup>d</sup>	828 <sup>d</sup>	829 <sup>d</sup>	830 <sup>d</sup>	831 <sup>d</sup>	832 <sup>d</sup>	833 <sup>d</sup>	834 <sup>d</sup>	835 <sup>d</sup>	836 <sup>d</sup>	837 <sup>d</sup>	838 <sup>d</sup>	839 <sup>d</sup>	840 <sup>d</sup>	841 <sup>d</sup>	842 <sup>d</sup>	843 <sup>d</sup>	844 <sup>d</sup>	845 <sup>d</sup>	846 <sup>d</sup>	847 <sup>d</sup>	848 <sup>d</sup>	849 <sup>d</sup>	850 <sup>d</sup>	851 <sup>d</sup>	852 <sup>d</sup>	853 <sup>d</sup>	854 <sup>d</sup>	855 <sup>d</sup>	856 <sup>d</sup>	857 <sup>d</sup>	858 <sup>d</sup>	859 <sup>d</sup>	860 <sup>d</sup>	861 <sup>d</sup>	862 <sup>d</sup>	863 <sup>d</sup>	864 <sup>d</sup>	865 <sup>d</sup>	866 <sup>d</sup>	867 <sup>d</sup>	868 <sup>d</sup>	869 <sup>d</sup>	870 <sup>d</sup>	871 <sup>d</sup>	872 <sup>d</sup>	873 <sup>d</sup>	874 <sup>d</sup>	875 <sup>d</sup>	876 <sup>d</sup>	877 <sup>d</sup>	878 <sup>d</sup>	879 <sup>d</sup>	880 <sup>d</sup>	881 <sup>d</sup>	882 <sup>d</sup>	883 <sup>d</sup>	884 <sup>d</sup>	885 <sup>d</sup>	886 <sup>d</sup>	887 <sup>d</sup>	888 <sup>d</sup>	889 <sup>d</sup>	890 <sup>d</sup>	891 <sup>d</sup>	892 <sup>d</sup>	893 <sup>d</sup>	894 <sup>d</sup>	895 <sup>d</sup>	896 <sup>d</sup>	897 <sup>d</sup>	898 <sup>d</sup>	899 <sup>d</sup>	900 <sup>d</sup>	901 <sup>d</sup>	902 <sup>d</sup>	903 <sup>d</sup>	904 <sup>d</sup>	905 <sup>d</sup>	906 <sup>d</sup>	907 <sup>d</sup>	908 <sup>d</sup>	909 <sup>d</sup>	910 <sup>d</sup>	911 <sup>d</sup>	912 <sup>d</sup>	913 <sup>d</sup>	914 <sup>d</sup>	915 <sup>d</sup>	916 <sup>d</sup>	917 <sup>d</sup>	918 <sup>d</sup>	919 <sup>d</sup>	920 <sup>d</sup>	921 <sup>d</sup>	922 <sup>d</sup>	923 <sup>d</sup>	924 <sup>d</sup>	925 <sup>d</sup>	926 <sup>d</sup>	927 <sup>d</sup>	928 <sup>d</sup>	929 <sup>d</sup>	930 <sup>d</sup>	931 <sup>d</sup>	932 <sup>d</sup>	933 <sup>d</sup>	934 <sup>d</sup>	935 <sup>d</sup>	936 <sup>d</sup>	937 <sup>d</sup>	938 <sup>d</sup>	939 <sup>d</sup>	940 <sup>d</sup>	941 <sup>d</sup>	942 <sup>d</sup>	943 <sup>d</sup>	944 <sup>d</sup>	945 <sup>d</sup>	946 <sup>d</sup>	947 <sup>d</sup>	948 <sup>d</sup>	949 <sup>d</sup>	950 <sup>d</sup>	951 <sup>d</sup>	952 <sup>d</sup>	953 <sup>d</sup>	954 <sup>d</sup>	955 <sup>d</sup>	956 <sup>d</sup>	957 <sup>d</sup>	958 <sup>d</sup>	959 <sup>d</sup>	960 <sup>d</sup>	961<
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TABLE G.—TOWNS.—DEATHS BY AGES, MONTHS AND DISEASES, 1886.

## RECAPITULATION.

MONTHS.												CAUSE OF DEATH.	Total.	AGES.													
January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			Under 1 year.	1 to 5.	5 to 10.	10 to 15.	15 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 and Over.	Unknown.
1	1	1	1	1	1	2	16	6	1	1	1	28	Cholera Infantum	24	4												
2	5	1	2	1	1	1	3	1	7	6	2	31	Croup	8	17	6											
1	1	1	1	1	1	12	27	15	8	2		66	Diarrhea and Dysentery	41	10	1	3		1	1	1	2	5	1			
6	12	12	11	8	3	7	10	12	7	17	13	118	Diphtheria	10	56	37	8	5	1								1
1	1	1	1	4	1	1	2	5	11	4	1	80	Typhoid Fever		6		3	4	7	6	2	2					
5	5	2	1	1	9	3	2	1	1	2		26	Scarlet Fever	3	16	4	2			1							
3	2	2	2	1	3	2	2	2	1	1		21	Other Fevers	1	9	3	3			2		2	1				
	1	1	1	1	1	1	1	1	1	1		2	Measles		2												
1	1	1	1	1	1	2	1	1	1	1	1	9	Whooping Cough	6	3												
8	14	13	7	11	13	11	10	18	9	8	10	132	(Anæmia, including Infantile Debility)	104	12	2		2	2	1	3	2	3			1	
5	4	3	3	1	1	3	2	1	2	1	1	24	Dropsy		2			1	4	1	2	4	3	6	1		
3	1	2	5	4	4	4	2	3	7	1	2	38	Cancer					1	1	4	5	11	9	5	1	1	
19	17	22	21	22	19	15	15	11	13	14	11	199	Phthisis	8	3	1	7	27	61	31	30	15	11	2	1		2
11	14	16	20	19	22	20	15	10	14	15	13	189	(Nervous Diseases, including Convulsions)	56	26	9	5	7	9	6	21	15	19	10	11		1
6	9	12	4	10	8	5	9	11	7	7	3	91	Heart Diseases	1	1	4	3	1	8	10	8	9	23	18	4	1	
18	14	19	28	20	14	12	5	8	7	13	14	172	Pneumonia*	37	35	10	1	5	12	13	11	14	19	9	6		

7	12	21	3	7	4	8	15	10	4	2	4	78	Enteritis and Gastritis	14	7	3	10	7	9	6	6	5	7	2	1	1	
.....	6	1	1	.....	1	2	.....	2	1	2	2	48	Liver Diseases	.....	.....	.....	.....	.....	1	1	5	4	3	4	.....	.....	
4	1	4	8	3	3	3	4	4	7	3	5	49	Kidney Diseases	.....	2	1	.....	2	6	5	4	9	7	9	3	1	
3	5	2	1	2	1	.....	3	2	3	.....	.....	22	Child Birth	.....	.....	.....	.....	2	7	8	5	.....	.....	.....	.....		
12	9	13	14	14	10	9	9	12	14	9	13	140	Old Age	.....	.....	.....	.....	.....	.....	.....	.....	.....	62	61	17	.....	
3	5	5	4	4	6	3	10	7	4	1	6	56	Violent Deaths	.....	3	5	4	4	14	5	4	7	4	2	.....	.....	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	Suicide	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	
16	11	25	29	24	13	46	13	15	12	17	10	201	(Other diseases and cause not specified	59	19	5	4	7	16	18	8	17	16	6	2	24	
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
135	143	157	162	157	137	141	175	156	139	127	112	1741	.....	366	233	91	53	70	163	117	118	112	131	143	94	19	31

\* Includes Bronchitis.

H. S. CREWE,  
*Inspector.*

TABLE H.—DEATHS BY

COUNTIES.	Agents.		Artists.		Brickmakers.		Blacksmiths.	
	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
Algoma .....								
Brant .....	2	106					3	157
Bruce .....			1	36			1	63
Carleton .....	4	228	2	88	1	61	2	69
Dufferin.....	1	31						
Elgin .....							1	76
Essex .....								
Frontenac .....							3	233
Grey .....	1	36					1	24
Haldimand.....							1	70
Haliburton.....							1	21
Halton .....							1	21
Hastings .....	1	74			1	68	3	211
Huron .....			1	36			2	87
Kent.....							1	62
Lambton .....							6	294
Lanark.....	1	60						
Leeds and Grenville.....	1	37			1	46	5	175
Lennox and Addington.....	1	32						
Lincoln .....								
Middlesex .....	3	156			1	51	5	258
Muskoka and Parry Sound.....	1	26						
Norfolk .....							4	186
Northumberland and Durham.....					1	66	5	234
Ontario .....	1	76	1	32			2	97
Oxford .....							1	39
Peel .....	1	44					1	42
Perth .....	2	103	1	38			1	77
Peterborough.....								
Prescott and Russell.....	1	29						
Prince Edward .....	1	27					2	44
Renfrew .....								
Simcoe.....	3	115					2	46
Stormont, Dundas and Glengarry.....	1	30					2	83
Victoria.....					1	48		
Waterloo .....	1	54						
Welland .....							2	82
Wellington .....	1	30					7	355
Wentworth.....							2	150
York .....	10	492	5	197	2	75	8	428
Totals.....	38	1786	11	427	8	415	75	3684

## OCCUPATIONS, 1886.

Brewers and Distillers.		Bricklayers.		Barbers.		Butchers.		Book-keepers and Clerks.		Bankers.		Bakers and Confectioners.	
No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
								1	38			1	57
						2	115	1	37	1	50	1	56
		2	107	1	65	5	185	4	141			4	288
								3	94				
				1	54	1	80	1	30			1	36
						1	71	2	42				
						1	86	2	83	1	68	1	48
1	27							2	60				
1	76							1	48				
				1	29	1	74	1	21	1	33	1	27
						1	51	3	140				
								3	121				
		1	34			1	45	3	132			2	101
								3	85				
				1	52			2	100			1	49
								5	242				
1	72	1	48	2	71	1	55	3	122			1	24
								2	94				
								6	218			1	57
						1	59						
				1	23	1	72	3	139				
						2	82	6	176	1	59	1	67
						1	43	3	149				
		2	119	1	45	1	42	3	175			1	75
		1	74	1	44	1	45	1	45				
								1	24	2	58		
						1	37	3	125				
						1	71	3	97	1	88		
								1	25				
								1	61				
				1	21	5	246	2	47				
						2	132	1	30				
								1	35				
1	86							3	78	1	60	1	46
2	73	2	145	1	30			2	70	1	34		
1	45			1	39	2	102	2	84			1	75
						5	236	8	241	3	151		
4	209	2	109	4	126	8	457	29	1095	2	100	3	157
11	588	11	636	16	599	45	2386	123	4606	14	701	21	1158



TABLE H.—DEATHS BY

COUNTIES.	Carpenters.		Cabinet-makers.		Coopers.		Cooks.	
	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
Algoma .....								
Brant .....	5	264			1	60		
Bruce .....	4	267	1	28	2	123		
Carleton .....	9	465	2	108				
Dufferin .....	2	122						
Elgin .....	4	240			1	87		
Essex .....	5	251			1	121		
Frontenac .....	6	333	2	113	2	115		
Grey .....	7	342						
Haldimand .....	1	45			1	79		
Haliburton .....								
Halton .....	3	206			1	44		
Hastings .....	5	272	2	136				
Huron .....	3	157			1	63		
Kent .....	3	96					1	45
Lambton .....	7	375						
Lanark .....	9	557						
Leeds and Grenville .....	2	75						
Lennox and Addington .....	5	333			1			
Lincoln .....	5	289			1	82		
Middlesex .....	11	577	2	80	1	77		
Muskoka and Parry Sound .....	2	97						
Norfolk .....	1	74						
Northumberland and Durham .....	6	327						
Ontario .....			1	29	1	55		
Oxford .....	4	282	1	77			1	21
Peel .....	1	81						
Perth .....	6	358						
Peterborough .....	2	92			1	74		
Prescott and Russell .....								
Prince Edward .....	3	187						
Renfrew .....								
Simcoe .....	6	288						
Stormont, Dundas and Glengarry .....					1	50		
Victoria .....	2	109						
Waterloo .....	3	204			2	133		
Welland .....	2	124			2	169		
Wellington .....	5	282			1	72		
Wentworth .....	11	558	3	106				
York .....	23	1248	4	238	1	65	1	71
Totals .....	173	9577	18	915	21	1469	3	137

OCCUPATIONS, 1886.—*Continued.*

Chemists and Druggists.		Clergymen.		Contractors and Builders.		Carriage and Wagon Makers.		Dentists.		Engineers.		Editors.	
No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
		1	37	1	57					3	112		
1	29	1	71	1	29								
1	67	1	74			1	22			1	60		
				4	214					4	197		
										1	30		
		1	83							1	50		
		1	79	1	24					1	56		
						2	124						
1	59	1	39	1	54	1	61	1	77	1	36		
					73	1	28						
		2	167							3	154		
										2	95		
		2	70	1	38	2	103						
1	65			1	41	2	85						
1	73			2	121			1		1	28		
		2	149	2	109	2	83			2	76		
						2	94						
1	33	1	63	1	70	2	122			1	31		
						1	86						
1	21	2	101			1	63			1	48		
		2	120										
1	47					1	65						
1	25	1	58							2	56		
1	84			1	48								
						1	37			1	71		
1	64					2	100			1	21		
1	72	1	36	1	52					1	38		
		1	80										
				1	68	1	63						
						1	78			1	26		
						2	97						
				1	34	1	43						
		3	209	2	115	1	47						
1	72	2	140	1	74	3	140			1	35	1	37
						3	96			1	75		
2	71	8	520	7	455	4	249			5	265	2	96
15	782	33	2096	30	1676	37	1886	1	77	35	1560	3	133

TABLE H.—DEATHS BY

COUNTIES.	Farmers.		Farmers' Wives.		Gardeners.		Gentlemen.	
	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
Algoma .....	31	1609	12	684	1	50	3	161
Brant .....	44	2772	38	2198	1	43	6	390
Bruce .....	99	6079	65	3585			4	314
Carleton .....	87	5694	46	2768	2	139	2	171
Dufferin .....	37	2468	29	1617			2	117
Elgin .....	52	3308	28	1855			5	325
Essex .....	65	3742	60	3506			4	294
Frontenac .....	56	3467	50	2800	1	48	3	182
Grey .....	121	7611	99	5876			4	241
Haldimand .....	42	2834	41	2501				
Haliburton .....	14	643	15	751				
Halton .....	34	2076	39	2218			5	394
Hastings .....	70	4223	30	1766	1	52	10	663
Huron .....	100	6471	108	6518			8	551
Kent .....	70	4278	42	2050			5	404
Lambton .....	59	3436	63	3295	3	226	3	239
Lanark .....	56	3790	59	3285	1	86	2	147
Leeds and Grenville .....	99	6493	68	4391			9	549
Lennox and Addington .....	41	2571	25	1606			3	204
Lincoln .....	47	2977	37	2286	2	49	6	370
Middlesex .....	136	8313	95	5742	6	359	17	1141
Muskoka and Parry Sound .....	42	2294	32	1834				
Norfolk .....	59	3768	68	3932			3	203
Northumberland and Durham .....	108	6595	87	5146	1	76	12	907
Ontario .....	60	3743	64	3775	1	69	12	942
Oxford .....	97	5886	88	5379			4	285
Peel .....	40	2465	57	3471			6	405
Perth .....	90	6046	61	3807			7	495
Peterborough .....	61	3427	28	1624			2	149
Prescott and Russell .....	40	2475	58	3555				
Prince Edward .....	54	3276	42	2446			2	140
Renfrew .....	52	3543	31	1899			1	87
Simcoe .....	89	5512	79	4936	2	169	4	286
Stormont, Dundas and Glengarry .....	105	7147	97	6429			1	35
Victoria .....	38	2363	37	2120	1	68	4	340
Waterloo .....	55	3510	65	4151	1	29	14	1038
Welland .....	48	3322	27	1581			4	280
Wellington .....	100	6360	86	5694			7	512
Wentworth .....	50	3189	53	3253	2	127	2	77
York .....	94	6359	84	5272	8	439	28	1725
Totals .....	2642	166135	2193	131602	34	2029	214	14763

OCCUPATIONS, 1886.—*Continued.*

Hunters and Fishermen.		Housewives.		Laborers.		Lumbermen.		Lawyers.		Milliners and Dressmakers.		Masons.	
No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
2	51	5	285	12	395	2	93	.....	.....	.....	.....	2	107
.....	.....	56	2878	20	1210	2	87	1	55	.....	.....	.....	.....
3	191	21	1136	11	576	.....	.....	1	42	1	21	2	141
.....	.....	36	1864	29	1594	2	108	.....	.....	.....	.....	2	119
.....	.....	11	550	3	142	.....	.....	.....	.....	.....	.....	.....	.....
1	45	28	1465	12	587	1	68	.....	.....	2	92	.....	.....
1	63	43	2103	37	1652	.....	.....	2	104	.....	.....	.....	.....
.....	.....	34	2011	30	1751	1	48	.....	.....	.....	.....	1	27
1	48	45	2511	11	576	.....	.....	.....	.....	1	86	1	64
.....	.....	11	651	11	622	.....	.....	.....	.....	1	40	.....	.....
.....	.....	3	161	2	53	.....	.....	.....	.....	.....	.....	.....	.....
2	50	24	1455	9	490	.....	.....	.....	.....	.....	.....	1	65
.....	.....	46	2759	25	1614	1	23	1	59	1	28	1	71
.....	.....	29	1483	22	1232	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	14	723	23	1247	1	64	.....	.....	.....	.....	.....	.....
1	32	39	1849	6	289	3	141	2	50	1	31	.....	.....
.....	.....	26	1244	11	553	1	67	.....	.....	.....	.....	1	65
.....	.....	59	3153	25	1277	.....	.....	1	25	2	46	.....	.....
2	113	15	663	8	357	.....	.....	.....	.....	.....	.....	1	75
.....	.....	48	2882	19	1061	.....	.....	1	65	.....	.....	2	92
.....	.....	104	5969	40	2167	.....	.....	.....	.....	2	58	1	56
.....	.....	5	182	9	301	1	40	.....	.....	.....	.....	.....	.....
.....	.....	4	232	10	588	1	53	1	34	1	24	2	157
.....	.....	57	3190	37	2072	.....	.....	.....	.....	.....	.....	2	112
.....	.....	41	2197	25	1487	.....	.....	1	52	2	67	3	168
.....	.....	41	2052	11	673	.....	.....	.....	.....	1	23	3	165
.....	.....	40	2239	6	360	.....	.....	.....	.....	1	32	1	69
.....	.....	40	2377	14	891	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	44	2525	9	440	2	98	1	46	.....	.....	.....	.....
.....	.....	11	566	12	675	.....	.....	.....	.....	.....	.....	1	85
.....	.....	27	1519	4	162	.....	.....	.....	.....	1	48	.....	.....
.....	.....	14	810	22	967	3	98	.....	.....	1	45	1	89
.....	.....	31	1597	20	1123	2	57	.....	.....	.....	.....	2	129
.....	.....	27	1389	10	457	1	32	.....	.....	.....	.....	.....	.....
.....	.....	23	1258	7	330	3	185	.....	.....	.....	.....	.....	.....
.....	.....	34	2051	15	881	.....	.....	.....	.....	1	26	3	173
.....	.....	32	1805	22	1326	.....	.....	1	52	1	21	4	271
.....	.....	33	1795	25	1507	.....	.....	.....	.....	1	66	2	134
.....	.....	88	5545	53	2809	1	43	4	173	.....	.....	4	234
.....	.....	308	18762	118	6960	2	97	5	233	6	208	3	164
13	593	1597	89886	795	42554	30	1402	22	990	27	962	46	2832

TABLE H.—DEATHS BY

COUNTIES.	Machinists.		Moulders.		Millers.		Millwrights.	
	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
Algoma .....								
Brant .....	1	26			4	215		
Bruce .....	1	28						
Carleton .....					1	23		
Dufferin .....								
Elgin .....								
Essex .....								
Frontenac .....	1	26						
Grey .....	1	21						
Haldimand .....					1	21		
Haliburton .....								
Halton .....								
Hastings .....	1	22						
Huron .....					2	118	1	80
Kent .....					1	30	1	73
Lambton .....			1	55				
Lanark .....	1	23						
Leeds and Grenville .....	1	43	2	69	1	38	1	57
Lennox and Addington .....	1	34	1	55				
Lincoln .....			1	62	1	64		
Middlesex .....	2	48	4	135	2	161	1	34
Muskoka and Parry Sound .....								
Norfolk .....	1	45			2	76	1	31
Northumberland and Durham .....					1	48		
Ontario .....			1	25	2	103		
Oxford .....					1	70		
Peel .....					1	70		
Perth .....					1	35		
Peterborough .....	2	86	1	22				
Prescott and Russell .....					1	32		
Prince Edward .....								
Renfrew .....								
Simcoe .....			1	45	1	33		
Stormont, Dundas and Glengarry .....								
Victoria .....								
Waterloo .....	1	21	1	74				
Welland .....			1	65				
Wellington .....	2	109	1	21	2	139		
Wentworth .....	14	627	2	78	2	135		
York .....	10	456	3	149	4	266	2	125
Totals .....	40	1615	20	855	31	1677	7	400



OCCUPATIONS, 1886.—*Continued.*

Musicians.		Manufacturers.		Merchants.		Miners.		Other Mechanics.		Painters.	
No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
				1	45	2	127			1	26
				2	141			2	69	2	99
		4	169	2	79					2	93
		1	39	6	322			1	75	2	88
								1	24		
		2	103	2	112			2	132		
				1	55			1	42		
		2	148	1	170			1	32	1	29
				3	154			1	74		
				3	126						
								1	54		
				5	224			2	132		
		3	172	6	249			4	138	1	29
				2	77					1	35
		2	83	4	205	1	81	3	156	1	25
		2	129	2	118	1	28				
		1	35	4	284			3	131	2	124
						1	76				
		2	83	3	183			10	601		
1	34	4	251	7	323			3	97		
1	31	1	52	1	45						
				4	177			2	50		
		1	46	4	173			1	22		
		3	93	4	223			1	64		
		1	65	3	198			1	47		
		1	57	8	356			1	31		
1	49			3	176						
		1	68	1	23					1	34
		1	26	2	100					1	31
				3	174			1	27		
				1	33			2	120		
				3	187			4	201		
				2	108			1	56	1	47
		2	143	1	40	1	63	3	96		
		2	154	2	109	1	50	1	22	2	160
		1	29	5	322			3	195		
1	26	3	174	13	751			8	272	2	85
3	161	6	365	36	1982	3	177	18	836	8	324
7	301	46	2484	150	7944	10	602	82	3796	28	1229



TABLE H.—DEATHS BY

COUNTIES.	Printers.		Provincial Land Surveyors.		Physicians.		Pedlars.	
	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
Algoma .....							1	28
Brant .....					1	74		
Bruce .....					1	70		
Carleton .....	1	67	1	38	1	69	1	29
Dufferin.....								
Elgin .....					1	78		
Essex .....								
Frontenac.. ..	1	21			1	45		
Grey.....								
Haldimand.....					1	62		
Haliburton.....								
Halton .....	2	69			1	52		
Hastings .....								
Huron .....					2	53		
Kent.....								
Lambton .....	1	55						
Lanark .....					1	29		
Leeds and Grenville .....								
Lennox and Addington .....					2	75		
Lincoln .....	1	28			3	208	1	24
Middlesex.....	1	21	1	32	3	218	1	63
Muskoka and Parry Sound.....								
Norfolk .....	1	33			1	80		
Northumberland and Durham.....					5	229		
Ontario .....								
Oxford .....	1	29			1	41		
Peel .....					1	23		
Perth .....					1	44		
Peterborough.....	1	21			2	143		
Prescott and Russell.....					1	34		
Prince Edward .....							2	118
Renfrew .....								
Simcoe .....								
Stormont, Dundas and Glengarry .....	2	84						
Victoria.....					1	62		
Waterloo.....	2	76			1	27		
Welland .....								
Wellington.....								
Wentworth.....	3	92			2	131		
York.....	5	246			2	96	1	51
Totals.....	22	842	2	70	36	1943	7	313

OCCUPATIONS, 1886.—Continued.

Plasterers.		Public Officials.		Railroad Employees.		Servants, Female.		Stonecutters.		Shoemakers.	
No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
				5	176	4	109			1	70
				2	48	2	91			1	37
1	57			1	32					2	148
1	65	28	580	3	93	4	118	1	27	1	64
						1	22				
				2	65					1	67
1	69	1	87	2	73	3	270				
1	86	2	83			9	327	1	39	4	250
		2	82	1	41	1	51			1	86
		2	103								
		2	158			1	28	1	33		
				1	24	2	55				
		1	68	1	43	2	84			2	99
2	158	2	111	1	46					2	105
		3	201	2	70					2	160
		1	27			1	40			4	225
1	74	2	126	1	60			1	30	4	268
				1	23					1	65
		5	305			2	159	2	61	2	118
				4	188	6	223			5	308
				1	40	1	51			1	70
				1	29						
		4	301	3	82						
		2	90	1	26	1	27			1	39
		2	143	1	50	3	185	1	36	5	234
						2	100			2	147
				3	73	3	147				
		1	178			1	24				
										1	66
										4	196
		1	85			3	84			1	76
		2	126	2	66	2	115			1	51
1	27					3	164			4	302
		1	64	1	44	2	65			1	23
		2	145	3	160			1	52	3	231
		3	234	4	119	2	112	2	81	4	264
3	129	3	176	2	58	4	185			5	255
1	24	2	138	3	97	1	64			3	121
3	151	16	992	3	132	11	393	3	175	20	1131
15	840	90	4503	55	1958	77	3293	13	534	89	5276

TABLE H.—DEATHS BY

COUNTIES.	Sailors.		Saddlers and Harness- makers.		Seamstresses.		Tinsmiths.	
	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
Algoma .....			1	27				
Brant .....					3	117		
Bruce .....							1	23
Carleton .....			1	41				
Dufferin .....								
Elgin .....	1	72			1	24		
Essex .....	2	100						
Frontenac .....	5	245						
Grey .....	1	60					1	22
Haldimand .....								
Haliburton .....								
Halton .....					1	23		
Hastings .....	1	26			2	83		
Huron .....			1	27			1	54
Kent .....	2	74	1	62				
Lambton .....	1	50	1	29			1	30
Lanark .....			1	43			1	46
Leeds and Grenville .....	3	134	1	36	1	30	1	27
Lennox and Addington .....								
Lincoln .....	4	160						
Middlesex .....	1	45	1	61	6	278	1	68
Muskoka and Parry Sound ..								
Norfolk .....								
Northumberland and Durham .....	1	22	2	107	3	81	1	27
Ontario .....					1	23		
Oxford .....	1	37	1	44	1	25		
Peel .....			2	145				
Perth .....								
Peterborough .....								
Prescott and Russell .....								
Prince Edward .....					1	24		
Renfrew .....					1	25	1	23
Simcoe .....	1	70					1	64
Stormont, Dundas and Glengarry ..							1	36
Victoria .....			1	41				
Waterloo .....							1	21
Welland .....			1	47			1	77
Wellington .....			2	61	3	81	2	110
Wentworth .....	6	340						
York .....	5	210	1	29	6	232	4	160
Totals .....	35	1645	18	800	30	1046	19	788

OCCUPATIONS, 1886.—*Continued.*

Teamsters.		Tavern Keepers.		Tobacconists and Cigar- makers.		Teachers.				Telegraph Operators.	
						Male.		Female.			
No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
		3	138	1	21	1	52				
		1	39								
		2	70					1	21		
3	141	2	72			4	215				
		1	58								
		2	80			1	80	1	24	1	23
1	80	1	49	1	40			1	23		
		3	157								
1	62	2	88			2	102				
						2	113				
		2	107								
1	73	2	95	1	21						
		3	155								
		3	153					1	28		
										1	41
1	25							3	85		
2	108	1	50			1	80				
		3	120								
1	56	1	64			2	78				
4	176	3	107			2	151	2	43	1	21
1	34	1	32								
1	72	3	161					1	21		
		2	60			1	30	2	56		
		2	108	1	34	1	42				
						2	58				
				1	37	2	98				
						1	86			1	41
						1	24				
4	121					2	130				
1	21					1	84				
		2	103								
		2	105								
		1	32			1	55				
2	62	2	100	1	31	4	252				
2	109	1	35	1	30	4	291				
13	618	5	231	2	49	3	188	4	103		
38	1758	56	2569	9	263	33	2209	16	404	4	126

TABLE H.—DEATHS BY

COUNTIES.	Tailors.		Tanners and Curriers.		Volunteers, Soldiers and Pensioners.		Watchmakers and Jewellers.	
	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.	No.	Total Ages.
Algoma .....					2	123		
Brant .....			1	47			1	31
Bruce .....	1	26			1	34		
Carleton .....	1	60			7	478		
Dufferin .....								
Elgin .....	3	238						
Essex .....					4	302		
Frontenac .....					4	247		
Grey .....								
Haldimand .....					2	115		
Haliburton .....								
Halton .....					2	111		
Hastings .....								
Huron .....	2	113	1	46				
Kent .....	3	187						
Lambton .....	2	122	1	34				
Lanark .....							1	74
Leeds and Grenville .....	2	105						
Lennox and Addington .....								
Lincoln .....					2	170	1	84
Middlesex .....	5	269			3	207	1	53
Muskoka and Parry Sound .....							3	119
Norfolk .....	1	62			1	89		
Northumberland and Durham .....	4	246						
Ontario .....			1	85				
Oxford .....								
Peel .....								
Perth .....	3	212						
Peterborough .....	1	60						
Prescott and Russell .....								
Prince Edward .....					1	75		
Renfrew .....	1	65						
Simcoe .....	1	63			1	97		
Stormont, Dundas and Glengarry .....	1	58	1	34				
Victoria .....	5	260					1	42
Waterloo .....	1	69						
Welland .....					1	64		
Wellington .....	1	80	2	143	1	73		
Wentworth .....	1	79			4	307	1	44
York .....	9	558			11	728	4	115
Totals .....	48	2932	7	389	47	3220	13	562

OCCUPATIONS, 1886.—*Concluded.*

Weavers.		Other Occupations.		Total Number of Deaths.	Total Ages.	
No.	Total Ages.	No.	Total Ages.		Aggregate.	Average.
.....	.....	.....	.....	100	4678	46.7 years.
.....	.....	2	121	211	11706	55.5 "
.....	.....	.....	.....	243	13793	56.7 "
.....	.....	3	118	324	17490	54.0 "
1	75	.....	.....	92	5320	57.8 "
1	44	.....	.....	160	9484	59.3 "
.....	.....	.....	.....	241	13175	54.6 "
1	66	1	69	235	13486	57.2 "
2	140	.....	.....	317	18644	58.8 "
.....	.....	1	36	125	7666	61.3 "
.....	.....	.....	.....	35	1629	48.6 "
.....	.....	.....	.....	138	7924	57.4 "
.....	.....	.....	.....	226	13278	58.1 "
1	88	.....	.....	312	18363	55.6 "
.....	.....	.....	.....	194	10741	55.3 "
1	57	1	37	227	11928	52.5 "
2	48	.....	.....	192	10943	57.0 "
.....	.....	.....	.....	319	18681	58.3 "
.....	.....	.....	.....	118	6715	56.8 "
.....	.....	.....	.....	224	13247	59.1 "
1	77	4	205	519	29593	57.0 "
.....	.....	.....	.....	101	5207	51.5 "
1	49	2	145	175	10254	58.6 "
.....	.....	.....	.....	369	21202	57.4 "
2	148	.....	.....	246	14146	57.5 "
2	164	1	25	296	17126	57.8 "
.....	.....	.....	.....	171	10205	60.0 "
1	67	.....	.....	255	15611	61.2 "
.....	.....	.....	.....	172	9563	55.6 "
1	70	.....	.....	137	8076	59.0 "
1	80	.....	.....	156	8836	56.6 "
2	137	.....	.....	145	8517	58.7 "
4	281	.....	.....	276	16130	58.5 "
.....	.....	.....	.....	273	17184	63.0 "
.....	.....	.....	.....	138	7868	57.0 "
3	222	.....	.....	229	14108	61.6 "
.....	.....	.....	.....	180	10914	60.6 "
.....	.....	1	41	333	20240	60.8 "
1	23	6	309	392	22028	56.2 "
2	106	2	79	1018	57656	56.6 "
30	1942	24	1185	9614	553355	57.5 years.

H. S. CREWE, *Inspector.*





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# EIGHTH ANNUAL REPORT

OF THE

# ONTARIO AGRICULTURAL

AND

# EXPERIMENTAL UNION.

1887.

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*Printed by Order of the Legislative Assembly.*

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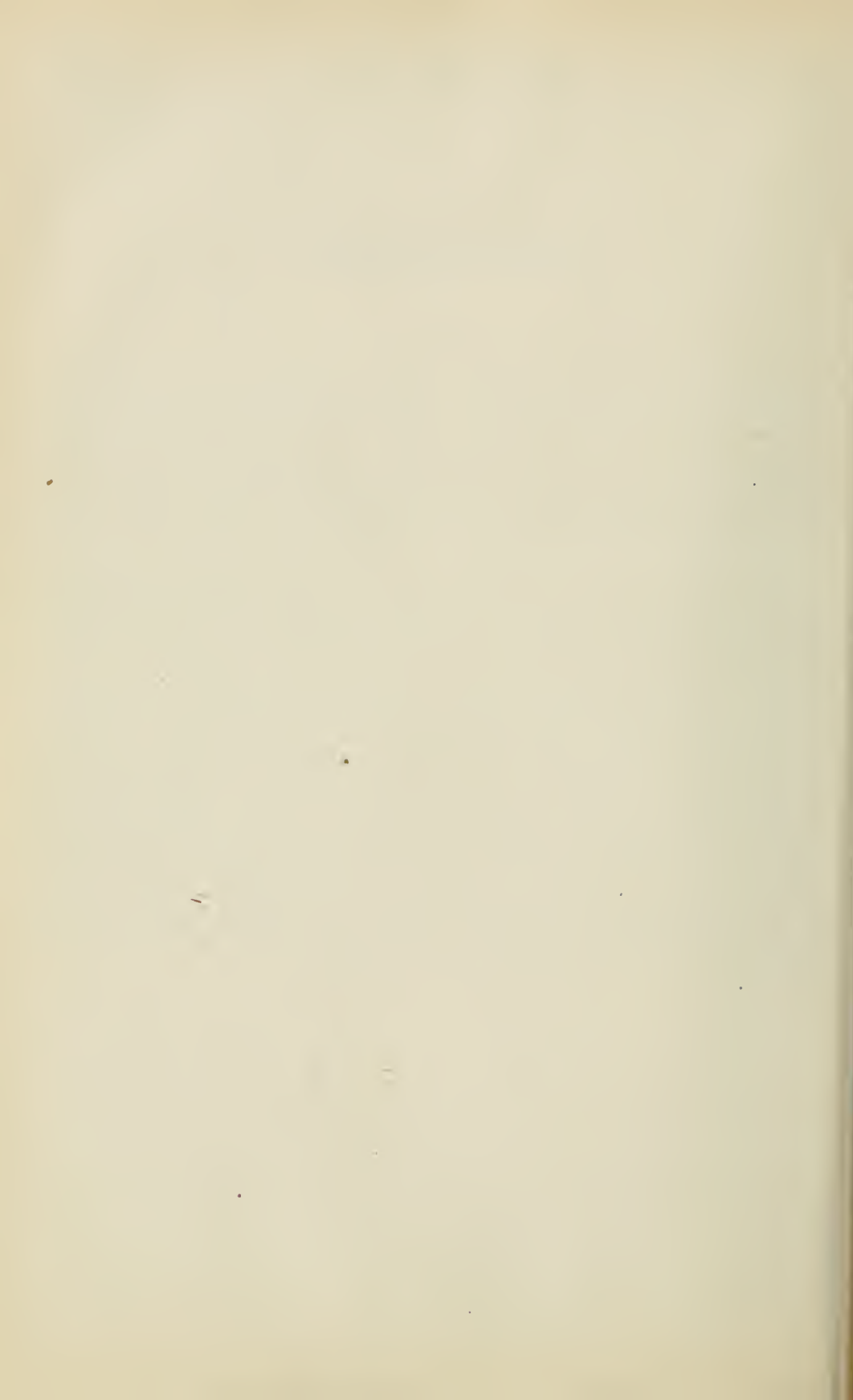
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## INTRODUCTION.

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In presenting the eighth report of the Union, a few remarks by way of introduction upon the Union's general progress and the increasing interest in its work manifested by its members and others may perhaps not be amiss. The attendance at the last meeting was good; several of our most prominent agricultural authorities were present and entered warmly into the discussions, rendering them most interesting and instructive to all. A new and important feature was the establishment of a "Question Drawer." Any member desiring information upon some point writes the same out in the form of a question and places it in the Question Drawer. At the most convenient time the drawer is opened and the questions are severally read out to the full assembly and discussed. The member thus has his question fully and searchingly entered into by the gathering. This, as can at once be seen, is of great benefit to all, valuable and useful information being gathered from the practical experience of those present upon the question under discussion. The opportunity thus offered of obtaining the opinion of so many upon knotty points was eagerly embraced, many lively and thoughtful discussions resulting. Much interest was evinced in the report of the experiments ably carried on during the last season by several members in the interests of the Society. Yet, although many valuable lessons can be learnt from the experiments, we venture to submit that before drawing any very definite conclusions it is undoubtedly necessary that so important a subject should be still more widely experimented upon. The number of experimenters for the coming year is much larger than heretofore. The results when given will, we have no doubt, enable us to draw fairly definite and accurate conclusions upon the respective merits of the various fertilizers under experiment.





## CONSTITUTION.

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For the benefit of those who are unfamiliar with the constitution and by-laws of the Union it has been decided at a meeting of the Executive Committee to publish them in this report.

### OBJECTS OF THE UNION.

The objects of the Association are to form a bond of union among the officers and students, past and present, of the Ontario Agricultural College and Experimental Farm, to promote their intercourse with the view to mutual information, to discuss subjects bearing on the wide field of agriculture with its allied sciences and arts, to hear papers and addresses delivered by competent parties, and to meet at least once annually for these purposes.

### ADMISSION OF MEMBERS.

All officers and students of whatever time shall be entitled to become members of the Union on paying their subscription. The Hon. the Commissioner of Agriculture for the Province of Ontario, the Presidents for the time being of the various Agricultural Societies of Ontario, and such parties as the Association deem it advisable to appoint, shall be honorary members of the Union.

### SUBSCRIPTIONS AND PRIVILEGES.

Members shall pay the sum of fifty cents annually. They are eligible to all the offices of the Union, and shall receive gratuitously any reports of the same which may be published after the date of such payment. For any reports previous to their admission they shall pay the sum of twenty-five cents.

Every ex-officer and ex-student, who is in regular accord with the Union, shall be considered as a corresponding member thereof. Each shall be entitled to the privilege of receiving for experimental purposes at least five samples annually of such agricultural seeds as may be on hand for distribution at the Ontario Experimental Farm. He shall report to the Union the results of such experiments, and also give his experience on such subjects as come within the scope of the Association. Ex-officers and students, who are members, shall be entitled to receive by correspondence, if necessary, such information on the work of the Union or that of the Ontario Agricultural College and Experimental Farm as may be deemed reasonable by the Executive Council.

### MEETINGS.

The Union shall meet annually at the Ontario Agricultural College for one day or more, beginning two days previous to the Easter closing exercises of the Institution.

### OFFICERS AND THEIR DUTIES.

The officers of the Union shall consist of a President, Vice-President, Recording Secretary, Corresponding Secretary, Treasurer and Editor of Transactions, who shall be appointed annually by the general meeting and hold office for the ensuing twelve months.

The President as chief officer of the Union shall be *ex-officio* a member of all committees or councils thereof during his term of office.

The Vice-President shall have powers similar to the President, but only in his absence.

The Recording Secretary shall keep the minutes of the general meetings of the Union.

The Corresponding Secretary shall conduct all business in connection with the Union in regard to memberships, general meetings, and all the business of the Executive Council, for which purposes he shall be *ex-officio* a member of that Council.

The Treasurer shall collect all fees and keep account of all receipts and disbursements of the Union as may be authorized by the general meeting and Executive Council.

The Editor shall receive, revise, and attend to the publication of such addresses, articles, or papers as may be authorized for publication in the transactions of the Union.

#### EXECUTIVE COUNCIL.

The Executive Council shall consist of the officers of the Union for the time being. Its duties shall be to prepare a programme for annual general meetings, invite and arrange with parties for the reading of papers, to appoint reception and sectional committees, and transact such other work as has been indicated for it in this constitution, or which may be hereafter authorized by the general meetings.

#### ACCOUNTS.

The accounts of the Union shall be audited annually by the Auditors appointed by the general meeting.

#### ALTERATION OF CONSTITUTION AND BY-LAWS.

No part of the constitution can be altered except at an annual general meeting of the Union, and then only by giving at least three hours' notice of such intended alteration.

## EIGHTH ANNUAL MEETING

OF THE

## ONTARIO AGRICULTURAL AND EXPERIMENTAL UNION.

The eighth annual meeting of the Ontario Agricultural and Experimental Union opened in the lecture-room of the Ontario Agricultural College, on Thursday morning, February 24th, 1887, at ten o'clock.

Mr. A. E. Shuttleworth, President of the Union, occupied the chair, and owing to the absence of Mr. R. W. Madge, recording secretary, Mr. C. A. Zavitz was appointed recording secretary *pro tem*.

After the reading of the minutes, Mr. R. F. Holterman, corresponding secretary, read a large number of communications received from individuals in various parts of Canada and the United States. The corresponding secretary's report referred to the heavy correspondence of the year and to the encouraging remarks of many prominent agriculturists over the Province on the work of experimentation.

The editor gave an account of the progress made in publishing the annual proceedings of the Union.

## TREASURER'S REPORT.

Mr. Ramsay submitted his report, as treasurer, as follows :

DR.		CR.	
To money received from R. A. Ramsay, treasurer of last year .....	\$14 35	By 100 post cards .....	\$ 1 00
To subscriptions received .....	47 00	“ printing 100 envelopes .....	75
		“ 500 railway certificates .....	3 00
		“ 300 circulars .....	2 00
		“ 500 four-page circulars .....	4 00
		“ 250 slips .....	50
		“ postage .....	8 57
		“ balance on hand .....	41 33
	<u>\$61 35</u>		<u>\$61 35</u>

## DISTRICT SECRETARIES.

Mr. Holterman brought up a motion with a view to appointing district secretaries for keeping up communication between the members of the Union and the executive committee, with the object of increasing the work, usefulness and interest of the Union. After some discussion the motion was carried, and the President appointed Professor Panton, Mr. Holterman and Mr. Wettlaufer as a committee to divide the Province into ten districts and to nominate the secretaries.

## THE PRESIDENT'S ADDRESS.

Mr. A. E. Shuttleworth, President of the Union, delivered the following address :

We, with the experience and lessons of another year, have been permitted to leave our fields of labor and gather at this our eighth annual convention of the Ontario Agricultural and Experimental Union.

It is with pleasure that we, being older and more experienced students of agriculture, re-enter these rooms to meet our teachers and fellow students, and again engage in the study and discussion of those subjects and experiments which are successfully and profitably directing us in the pursuit of agriculture. We have at this convention many who have not had the privileges and advantages of earlier lessons here, but to whom we feel indebted for their presence. We welcome you to our convention, inviting you as fellow-students to join in a full and diligent discussion of all questions arising from the subjects of our programme, as well as any others coming within your experience or observation.

For me to take up the time of this convention, named and convened as it is, in explaining the objects for which we have met, would be occupying time for purposes with which you are already all familiar. Rather let us consider the very favorable circumstances under which we, as an agricultural convention, are placed. In the first place, our members are graduates and students of an agricultural college that, since its first establishment, has been earnestly following up the study of those sciences directly bearing upon agriculture and extending, as far as has been within its power, the general experimental work. Secondly, the place where we hold our annual meeting enables us to come directly in association with those who are engaged constantly in the study of agriculture, and from whom the results of new and further investigations may be obtained freely at any time. And further, the interest which prosperous and progressive farmers always take in an agricultural college or experimental station, is a medium through which the most intelligent and long-experienced farmers are attracted to our convention. A convention thus composed and situated has the greatest opportunities for extending its work and helping to advance the interests of agriculture, and thereby considerably improve the general prosperity of our country. These are some of the favorable circumstances under which we, as a society, were born, and during the last eight years have been growing to our present attainment.

But during this infancy we have not lived in vain, although our efforts in the past have not been as practical as we intend they shall be in the future. One reason for this is, that we have not fully matured a uniform system upon which to carry on our experimental work ; we have not combined sufficiently all our resources, and consequently we do not obtain the same immediate and profitable results as we should under a more definite and extended system of experimental work. We especially ask for a very full and practical discussion of this question after the reading of a paper on "The Work of the Experimental Union," by Professor James, who has shown already his willingness to aid us in turning our efforts into the most useful channel. An instance of what we are doing and what can be done may be seen from reading our last annual report in which a very useful experiment in testing the comparative value of a number of manures upon a rotation of crops, was conducted by the members of our Union under seven different conditions of soil and climate. This experiment consisted in testing six different kinds of manures in ten different combinations upon a four years' rotation of cropping. Had this experiment been conducted by only one member and on only one variety of soil, its reliability would have been reduced ; but as it was conducted by a number of the members of this Union under a variety of conditions, both of soil and climate, more extended and reliable results were obtained in one year than by the former system could have been obtained in seven years. One party conducting these experiments has reported always a better result from the application of potash manures, while other members have reported by their tests better results from phosphate manures. From these results when compared, the parties engaged in these tests have been led to draw



conclusions regarding the probable requirements of their soil, and thus in one instance which has come to our notice—I refer to Mr. Ramsay, of the county of Halton—a very profitable investment was made by buying a quantity of hardwood ashes and applying them to his soil, which by the test was found to be deficient in potash.

Now such results, when compared and studied, are undoubtedly the most reliable source from which we can draw conclusions applicable to our individual circumstances. It is upon this idea, together with the tendency which is given to every one to continue his search after information, that the success of our efforts is ensured and our usefulness as an agricultural society made apparent. As practical farmers we, at all times, should be on the look-out for the newest and most profitable varieties of grains, grasses, etc. I see no quicker or better way, a way in which the least annoyance and disappointment is given, than by making regular yearly tests in as many different parts of the Province as possible, and then, at our annual meetings, compare results, and from these draw conclusions. There is no reason why we should not be able to lay before you at every meeting the results of the testing of twenty different varieties of grain grown in thirty or more different parts of the Province. And this work need not be confined to grain alone, for other tests may be made with special and unknown brands of manures, with tests in feeding and breeding stock, or it may be extended in certain cases to the growth and cultivation of fruit and trees. The opportunities for extending our experimental work are unlimited. All that we require is to enter into a more definite system of operation so that the results of tests of a class may be compared, and thereby the most characteristic failures in certain varieties of grain, manures, fruit, or trees, may be a lesson through which we can rely more certainly on other more successful experiments.

I regret that our report does not reach the members in time so that all who read may at once take advantage of these experiments: but those who attend our meetings and help to discuss and arrange the results of these tests, may the very next day commence to provide themselves with those grains, grasses, manures, etc., which in their opinion, based upon the tests made, will be a sure success. And further from our connection with the college and our previous instructions in conducting experiments, we could assist greatly those who are making tests from year to year at this experimental station: and we could do so greatly to our own advantage.

Besides the advantages gained from these experimental tests the members of our Union profit by the improvement and pleasure they derive through search after information pertaining to their occupation. Undoubtedly, a man who engages in general study and the cultivation of his mind, is a wiser person and enjoys his association with life to a fuller extent: and likewise, he who studies the sciences bearing upon agriculture and stores his mind with causes and effects, is a more useful farmer and enjoys more fully his association with agriculture and agricultural interests. We therefore appeal to every member of this Union to open your eyes to the field of useful work which we invite you to enter, and thus let us earnestly unite our efforts in carrying out the work of this convention.

Mr. R. A. Ramsay, Nassagaweya township, county of Halton, bore testimony as to the value the experiments conducted on the uniform system of the Union had been to him. He had found out by this means that potash manures were far more needed by his soil than the phosphate manures, and he had therefore purchased that kind of fertilizer with very beneficial results. His was a light soil, of a limestone formation.

#### MANAGEMENT OF MANURE.

Mr. A. Lehmann, of Orillia, then read the following paper—

In this Province, but much more so in this Dominion as a whole, the value that is contained in well managed manure is not appreciated, or is it that the difference between well and poorly managed manure is not known? One fact is certain, and that is, the manure of the farm does not receive its due amount of attention, as one example, that will with slight deviations apply to the large majority of Canadian farmers, will clearly illustrate. Last spring I visited a well known farmer, a breeder of pedigreed Shorthorn



cattle. There the buildings, but more especially the stock and fields, were in excellent condition; and every person seeing only these would have termed him a "first-class" farmer, as indeed they did. But on seeing his barnyard I did not think that he deserved this name; for this was a piece of ground, containing about one-tenth of an acre, that sloped towards a large creek which supplied his cattle with water the year round. It was, for the sake of shelter, enclosed on all four sides by farm buildings with their ridges parallel to the sides of the yard, leaving just sufficient room at the lowest corner of it for a driveway. On its entire surface was spread one large heap which the proprietor termed manure, but which might more appropriately be called a heap of leached straw, or a filter, for the water that fell on the one side of the roofs dropped on the pile, filtered through and ran off again as a little brown rivulet which finally entered the creek. The water was, of course, colored by material taken out of the pile, and this material consisted of the soluble salts essential for plant food, chief among which would be the valuable nitrates. The loss occasioned by such washing is by some reliable agricultural writers set down at from one-third to one-half of the original value of the pile; a great loss indeed. But the report of a still greater one awaits us, for the urine, which contains more than one-half of the entire value of the manure, was allowed to run off unchecked. Thus, by this mode of management, the manure, although not reduced in bulk and therefore requiring the same labor to haul, lost nearly three-fourths of its entire value. I do not know if the farmer in question was at the time aware of this stupendous loss. Likely he was not, for if so he would have checked it and not bought a high priced commercial fertilizer whose intrinsic value was a point of question. Is this not an unwise and extravagant mode of management, and is it any wonder that farming thus conducted is an unremunerative occupation? But how can this be improved? How reach the average farmer? and what way of management shall we advise him to follow? These are questions that have to be earnestly considered. Some men in their management of manure have resorted to liquid manure tanks and have put their solid manure into buildings specially constructed for that purpose.

But this method is, I think, still inferior to one generally adopted in Germany, a country in which agricultural chemistry has made much progress and in which much attention and importance is attached to the subject of manure, as some proverbs there much used will show; for instance, "Manure is the soul of agriculture," and "Show me your manure heap and I will tell you what kind of a farmer you are." There the "economist," as the agriculturist is called, keeps his cattle standing on the manure, his mature stock tied up while the younger ones are running loose in a separate stable, those of the same age and size together in one large stall. The young stock is rarely bedded with straw, peat or earth being generally used. These are good absorbents and give, unlike straw, a short and easily handled manure. The stables are large and roomy, and their entrance doors large enough to allow a team and waggon to pass through them. When the manure has reached the depth of from two to three feet it is hauled out into the field and there piled up in neat heaps, as much care and pride is there taken in the building of these heaps as here in that of a hay or straw stack. In these piles earth is intermixed with the manure in alternate layers, but this requires too much labor for Canadian agriculture. I shall not enlarge upon it, and will only say that they are covered with earth, which catches the ammonia if any should be given off, and if they are intended to stand for a somewhat longer time they are seeded with buckwheat or rape to shade them. In this method all the urine is mixed up with the solids, and thus saves the liquid manure tank, cart and pump that are necessary in the liquid manure tank system, their first cost, their keeping in repair, and the time necessary to use them; it will also be observed that no loss from overflowing tanks can possibly occur. The remainder of the manure is practically exempt from all loss; the cattle tramping over it check almost all fermentation while in the stable, and pack it so tightly that when it is hauled out to the field manure heaps it is still compact enough to prevent overheating, which is so often a cause of loss if the manure pile is kept too loose.

The above system is one which is especially recommendable for Canadian agriculturists, for the manure being hauled out in winter saves so much time in our short and much crowded spring, when the roads are soft and are liable to be "badly cut up" if much

used. If the straw for bedding be scarce, muck or sawdust might be used, together with horse manure, and this would be found to be equal if not greatly superior to the straw bedding. At the only farm in Canada at which I saw the above system carried out they were much better pleased with it than they at first anticipated. There the stable is a frame building, high and roomy, with its sills about  $2\frac{1}{2}$  to 3 feet from the ground, resting on a stone foundation. A space of about 14 to 15 feet is allowed to each row of cattle, and the main door is of sufficient breadth to allow a waggon or sleigh to pass in and out. The horses and cattle are both kept tied up in the same stable,—the horses on a plank floor which rests on the sills and keeps them above the highest level of the manure, while the cattle are standing on the ground. The horses are bedded with sawdust and straw, and the cattle with the horse manure and a little extra sawdust, which keeps them as dry as straw would on a plank floor. The air is as pure and fresh as it can be in a stable. The above method of management has so many strong points in its favor that every farmer would do well to think about it, examine it impartially, and then see how he might best adapt it to his circumstances and building.

Be economical : save your home manure and turn it to the best account before buying artificial fertilizers.

In answer to questions from President Mills, Mr. Lehmann said that the last farm he had referred to in his paper was their own. He objected to the use of liquid manure tanks on account of the additional labor and loss incurred. He had no bad smell in his stable from ammonia. The manure of the horses and the cattle was mixed, and it was cramped down by the cattle till it was about two feet deep, when it was taken out. They used a little sawdust to absorb the urine, but not much. They hauled out the manure into the fields and left it in square piles there.

Mr. Ramsay took up the question of handling manure. Their custom was to spread the stable manure on the land in the winter. They mixed the manure from the cattle and horses, made a pile and left it for three or four weeks to decompose, then spread it on the snow, and plowed it under in the spring. Their land was light. The manure did not prevent the frost from going out in the spring. They got on the land as soon as it was needed. They culled the bedding well, and took out no long straw. They used the straw and a little gypsum to absorb the liquid manure. They did not cut their straw ; they used it coarse. He did not believe in cutting straw, but cut hay a little in the spring. He did not believe it paid to cut straw for feed ; he did not mix meal and straw. He was not in favor of making the animals eat the cut-stuff, which they did not like, in order to get the meal which they wanted.

Mr. Wettlaufer, Oxford county, said his was a heavy clay soil. He had found it more profitable to draw the manure out at once. He culled his straw well. His land was level, and he did not think there was any loss in this method.

Mr. Lehmann admitted if the land was level there would be little loss ; but on sloping land there would be considerable manure washed away by thaws.

Mr. W. J. Stover, Oxford county, stated, as his experience, that he had been beaten in putting manure on frozen ground. He had a strong, level soil, but the frost had not come out even in the spring, and he could not work the land well ; it was patchy and very irregular. He took some of his manure out in February ; it had been tramped well up to that time. He put it in piles in the field, then distributed it evenly. He plowed his land in the fall and then gang-plowed the manure under in the spring. He thought it rotted thoroughly from February to spring. He sometimes applied a little gypsum to assist in decomposing the manure.

In reply to President Mills, Mr. Ramsay said he made no difference in his method of manuring, whether for grain or root crops.

Mr. Wettlaufer had manured in the fall after extra deep plowing. A field near him was manured in the spring, and gave better mangolds.

In reply to Prof. Panton, Mr. Lehmann said they kept down ammonia in the stables by the use of muck, clay, or straw. Straw would do very well, but there was considerable labor in hauling it out.

Mr. Ramsay said he did not appear to have many supporters for the method of spreading the manure on the snow. It was better for the manure to be decomposed in the land than in the barnyard. There was little loss on sloping land. Theirs was rolling land, and there was no difference in result between the hills and the flat places. Their soil, of course, was light. When the ground thawed the manure thawed, and when the ground froze the manure froze. His roots and fall wheat took all his farmyard manure; occasionally he put a little on barley. He spread in winter only for roots.

Mr. Stover agreed that winter-spreading for roots alone was all right. He thought foul seeds would be a trouble if manure was put out on cereal crops. He let it decompose under a shed. The manure made from the beginning of winter to March he hauled out for his barley and roots; that made from March to the end of winter he used for fall wheat. He gang-plowed it deep.

Mr. Beverley Jeffs, Bond Head, York county, said they spread manure in winter. They believed in getting manure on the land and into the land. They found little waste. If the manure was strawy they let it decompose in a pile in the field; if not strawy they spread it at once. They plowed it under in June.

Mr. T. Raynor, Rose Hall, Prince Edward county, applied his manure in the winter. It was better for the horses to team it in winter as they could take a bigger load on a sleigh. They spread from the sleigh on the land. The frost got out of the land soon enough for use in the spring; it did not keep them late. He advocated putting out the manure as soon as made. He had not found the foul seeds much hindrance.

Mr. A. E. Wark, Wanstead, Lambton county, said ninety per cent. of the farmers made their manure exposed in the barnyard. If they made a pile in the yard and it froze there, the frozen crust to the depth of about six inches could be taken off, and the manure easily handled.

Mr. Wettlaufer said that such eminent agricultural authorities as Arnold and Laws held that fresh manure was not so good for the root crop as well-rotted manure. The green manure had a tendency to make the roots stringy.

Mr. Ramsay did not put much faith in authorities, when he found by his own personal experience that his crops were better in spite of their opinions.

Mr. Wettlaufer said he used a few loads of well-rotted manure in preference to fresh manure on fall wheat. He spread the old manure thinner, however. The latter was much the best for the root crops also.

Mr. Robinson did not use the winter's manure until the following fall, when he plowed it in. He did not believe in winter-spreading. For fall wheat he drew out his manure before sowing. He once top-dressed on the snow, but found it frozen in the spring. He put manure on a summer-fallow after harvest before seeding. His wheat usually looked well.

Prof. Mills had met an Englishman at Cobourg at a Farmers' Institute there who found that he was losing money every year on his farm by plowing in his manure. He was on lightish land, and changed his method to applying the manure after the last plowing as a top-dressing, which made a big improvement. From all that he had heard he was disposed to think that manure, applied as a top-dressing late in the fall or in the winter would do for light lands, but plowing under in the fall was better for heavy lands. He would agree with Mr. Lehmann in discouraging manure tanks; they caused too much labor. If they were attended to and pumped up regularly they might be an advantage, but there were too many "ifs" about it. He would not advise the building of sheds to make manure under, although it was better to make manure under a covered shed, but any farmer, by care, might see that the soakage from his barnyard was diverted to his fields. Rain enough fell in the barnyard without the extra water from the buildings. Every farmer should have eave-troughs on his barns and stables, and wooden ones would answer the purpose if tin or galvanized iron troughs cost too much. Manure could be decomposed and made under a covered shed, in the barnyard or in the field. The manures were far better mixed; the warm manure of the horse with the colder manure of the cows and pigs. He had been over to Ithaca, N.Y., at a State Agricultural Convention, and while there he had inspected a barn in which the horses occupied half of the first floor, right over the manure yard. Of the basement, half was occupied by the cattle and



the other half was the manure yard. The manures there could be mixed very conveniently. The cattle were turned out into the yard, and tramped the manure thoroughly till it was about two and a-half feet deep, when it was hauled out; for the light lands it was taken to the fields and spread; the rest was left in the yard all winter. In partial thaw there would be a small loss; otherwise there would be no loss. This method of winter-spreading gave fine results around Newmarket, where he had been that winter. If equal results only were gained by top-dressing and plowing in manure, it was more convenient and cheaper to put out in winter.

Mr. Wark wanted to know why, if the manure was spread in winter, it was made and kept under cover to protect it against freezing?

Prof. Mills said that Prof. Roberts, at Cornell, contended it rotted more easily when well mixed and tramped under cover.

Mr. Stover mixed his manures, and allowed his hogs to root and spread it round the yard. He had no smell or firefanging.

Mr. Lehmann asked how they took care of their liquid manure at the stable Mr. Mills had spoken of. Did they apply enough absorbents to take up the liquid manures with the solids?

Mr. Mills said the cut corn and straw acted as absorbents, which was an incidental advantage in favor of the use of cut-straw for food and bedding.

Mr. Lehmann said the gain of making manure under cover was that the liquid manure was all saved. In no other way could the liquid manure be so well and so cheaply taken care of.

Mr. Wark said a liquid manure tank would only cost \$12, which would break nobody.

The President here closed the discussion to make room for the next paper, which was by Mr. James Cheesman, of Toronto.

## THE COMMERCIAL ASPECTS OF EXPERIMENTATION.

When you did me the honor of inviting me to address your meeting to-day, I assure you the compliment was most warmly appreciated, and it seemed to me that the most serviceable subject I could take would be the commercial character of your work. We cannot do better than recall the experience of the late Sir William Siemens, because I know of no man in our century who succeeded so well as he did in the department of applied science in industry. His work in heat, alone, might well occupy us for a few hours, had we time, but I must content myself with merely reminding you of his regenerative gas furnace, its ability to give much higher temperatures than could be obtained by any other mode of combustion, and all this at an economy of from 30 to 35 per cent. of fuel. Siemens was an electrician, too, and devised an electric furnace for high temperatures, besides working in the department of electric lighting. Not of least importance were his experiments as to the effect of artificial light through the medium of various colored glasses on vegetation, and also the application of electrical energy to mechanical work on the farm. In all these endeavors of his, the constant incentive was increased economy of production, and he generally came out with a greater profit on his work than could be shown by others who pursued older methods.

As I understand it, the object of your Union is to enable the members who have graduated at this institution to so apply the knowledge they have gained here as to produce a greater profit on their undertakings than those who have not had that advantage. To succeed in reaching this result we must at all times report failures with the same conscientiousness as we do successes, otherwise the work of this Union will fail. At the outset it is very important that we agree upon definite objects, and also upon well defined modes of attaining them.

Let us take certain recent experiments which have come under public notice, and about which we have had some very hard words, and not a little rough handling. During the last three years testing individual cows for the purpose of establishing the relative value of the different breeds has been very much resorted to. Your Professor Brown

has had a share in this work, and much good has resulted in stimulating enquiry among milk producers as to which breed was most economical, and what kind of a cow in any particular breed was the best to select for raising the milk, butter or cheese, at the least cost. All that a college can do is to start questions, illustrate modes of procedure, and report results faithfully. It is not a jury. That is the function of your Union. You can test herds for a whole year by asking your members to keep registers, as good business men should do, and bring the returns here. Could not county agricultural societies give prizes for excellence in the aggregate rather than for fancy points in a particular animal? We are told by the Bureau of Industries that 3,000 lbs. of milk is the average product of the Western Ontario cow, and that 2,700 lbs. is the mean of her Eastern Ontario sister. It is generally believed that it takes three acres per cow to raise this, or one acre to make less than 1,000 lbs. of milk. Remember these statistics come from the best men in each county, the poor and indifferent ones won't take the trouble to send returns. This is a very poor showing. The average milk product in Great Britain is 4,500 lbs., and it takes a vastly smaller area to feed the cow than with us. I know, and many of you are aware, that in every county of Ontario cows of all breeds can be found capable of doubling this 3,000 lb. yield from two acres. In saying this I am not thinking of the work you have heard of here, and which some of you have engaged in under our friend Professor Brown. I am thinking of men in the neighborhood of towns, cheese factories and creameries. I know a farmer whose milk record at a cheese factory for his seven cows for the season of six months was 35,000 lbs.; when told he had done well he did not think it extra good. I know heifers whose yield for 300 days was 6,700 to 7,000 lbs. on ordinary farm treatment—a pretty good result for their first year. Now, I want to urge on you the importance of lengthening the milking period with the first calf and don't be satisfied unless it reaches 300 days. Length of period is more important than the milk obtained the first year, valuable as that is. We must get rid of the idea that big yields are from individual phenomenal cows only. If I spoke of the milk yield from your two grades on permanent pasture objection might be made that 7,800 lbs. from two cows on one acre was not an every farmer's possibility. If I told you that Oakland's Jersey Stock Farm could show an average of over 6,200 lbs. for a herd of about 150, and that if it had been churned into butter, 417 lbs. per head for the year would have been the result, it would not influence you so much as instances of ordinary farmers who make milk a primary consideration. Well, here in Ontario you show about four per cent. of butter from your milk, and barely that. In the French counties of Quebec they make  $4\frac{1}{2}$  per cent., and their creamery or Separator butter is the best I know of in Canada. That is, it realizes a higher average on the market as creamery than any other. If we don't attack this question of economy at its source, depend upon it there is no use talking cheese factory, creamery, breed, or anything else. Are we getting all we can from our acres? Do we not feed too many cows, or get less milk for the energy we put into soil and attendance on animals than we should? Are we to till less for what we now get, or get more without reduction of area? Shall we go on feeding and caring for two animals when one can and does do the work of the two, or shall we double the yield? Shall we toy away on three acres when one will, and does under proper conditions, supply the product we get now from the larger area? The three acre estimate is, I am sure, less than is actually used for the average cow yield. We want greater accuracy in farm returns, but where and how can we get these except through your Union?

In 1883 I wrote a short article for the June or July issue of the Popular Science Monthly, on "Selection in Grain Growing." The object was to show the importance of applying the same principle to plants as we have long practised in breeding farm animals. Select seeds and propagate from the fittest only. Now why can not this be done? If men will pay thousands of dollars for cows and horses, why should not some kinds of seed be worth dimes or dollars per pound rather than cents. In our climate we have to stall feed cattle from six to seven months in the year, and it is very important that the seed we use for growing plants for stock feeding should be obtained at the lowest cost. This is the prime requisite. Unless we get reliable, and strong, vigorous seed, how can we have healthy plants? If we believe in breed, in high birth, why not in high

character in seed. We know the value of early growth in animals, how indispensable it is to them in laying the basis of constitution. Unless we use seed of the right kind can we expect crops of high nutritive value? Having decided the question of the best being cheapest, we must now settle how far permanent pasture is of service to us in Canada. I confess that in years gone by I was inclined to the Danish and Swedish system of soiling, or, as they say in England, of arable land dairying. But after what has been done in Ontario on your experimental plots here, and by farmers not in your Union, I have modified my views on Canadian pasture; much, however, remains to be done, in varying the proportions in the mixtures to suit the requirements of different soils. What proportion of a farm should be placed under pasture, and what under soiling crops is a question which must be settled by your own experience. I look forward with hope to the elucidation of these economical problems to the members of your Union who want to work for its advancement.

The provision of winter food is one which we must not overlook, and I do trust that some of you will satisfy yourselves that root growing should not be relied upon too exclusively for carrying stock through winter. "Too many eggs in one basket" is not without its application on the farm, and if only in this sense, some attempt should be made by your Union to determine the value and place of ensilage in Canadian farming. I have had the advantage of travelling over a large area, and of seeing many of the best farms in Canada, since 1883, and I am bound to say I look to ensilage as one of the most important crops of the future. I don't think it well to abandon roots entirely for ensilage, but I think they might be supplemented, and the quantity of dry fodder lessened by feeding this crop. I cannot pretend to say much about the crop in so short an address, which I wish to be suggestive rather than conclusive in its argument. Try ensilage, those of you who have thought most about it, and before you venture, learn from those who practice it with the best results what are the conditions, and I am sure you won't be disappointed. And now let me say, have faith in your work, and labor with the faith with all your strength and enthusiasm, and the results will not disappoint, though they may not always be quite what you expect.

In the discussion following the reading of the paper,

Mr. Wark opened out with the assertion that permanent pasture was not all that it was cracked up to be. The permanent pastures at the Farm might have been a success, but it did not therefore follow that it would be a success in other places. Two of his neighbors had tried the experiment and were \$200 each out of pocket, and no permanent pasture. He was doubtful as to the advisability of introducing Jersey blood into their dairy stock. He had found the best breed of cattle for the farmer to be the common Canadian cow. There was more profit in them than in any thoroughbred. They gave good butter results. When the Jerseys are past milking they are no good for anything else.

Mr. Mills—They are good for beef; the meat, they say, tastes like venison.

Mr. Wark—The butchers would have great trouble in skinning them for they could not lay them on their backs. As to soiling, he was afraid to try it. There has been a little done in Canada, and some in the United States. He believes in partial soiling; every farmer should sow an acre of corn, which could be fed green to his cows during the dry spell, when the pasture had given out. When a cow had once fallen back in condition, she could not fully recover that season, no matter what was done afterwards. He advised the use of corn to avoid this.

Mr. Little said he changed his cows from field to field. He depended entirely on pasture. He had spring creeks on his low lands, and the cattle ate the natural swamp grass which grew there. He made cheese in summer, and butter in winter.

Mr. Scrugham had carefully watched the permanent pasture at the Farm, and believed it was a success. Before he could pronounce it a failure in Mr. Wark's neighborhood, he would like to know how it was managed; whether the cattle had been put on it the first year, when the grass looked well, but the tramping of the cattle would kill the young roots and spoil the pasture; or perhaps it was injured from other causes? Two



cows had been put on one acre at the Farm to test the limit of the pasture, and not as a rule; the object was to see how much sustenance could be got out of one acre. On another plot of four acres four steers had been put; the first year's crop was cut and the second year they put the steers on. From May to September the gain was  $1\frac{3}{4}$  lbs. a day. If this was a fair guide, it would pay the farmer well to go to the expense of permanent pasture, as no ordinary pasture would give any result like  $1\frac{3}{4}$  lbs. Farmers say permanent pasture is not profitable, still it is worth while to make experiments with such an end in view. By using and testing all kinds of grasses, they would accustom the more permanent to this climate. Even if these so-called permanent pastures only lasted five or six years, the increase in pasturage in that time would amply repay the first cost. In five years more beef would be got off it than off an ordinary pasture. The one-acre plot and the four-acre plot at the Farm were sown with about the same grasses.

Mr. Wark said the men experimenting near him did not pasture their cattle on the prepared land the first year. He thought the Ontario Experimental Farm soil was especially adapted for permanent pasture; but on clay land permanent pasture of this kind would not succeed.

Mr. Scrugham said there had been men who visited the College in September last who had expressed themselves as being well satisfied with their own experience of permanent pasture.

Mr. Stover had found the common Canadian cattle better as milkers than any other class, but they could improve the milking qualities of these cows by judicious breeding: by crossing with families of different breeds known for their milking qualities. It was wise in breeding to keep beef in view as well as milk, as the cattle could be turned off for beef after they had ceased to give milk.

Mr. McCaig, Eramosa township, Wellington county, thought that for permanent pasture a good deal would depend on the soil. A sandy light soil was an advantage. Some three or four years ago he had been up in the dairying county of Oxford and had been shown there a field which had been pasture land for seventeen years without change. It had been originally what is called "black ash swales." He did not think they could pasture as many head on permanent pasture as on clover. As an instance, last year they had pastured on first year clover from May to July, two and a-half months, thirty-five head of cattle and ten horses on ten acres; the land was, however, in exceptionally good condition. They would in permanent pasture, though, take away the labor of sowing every second year. The expense of sowing and working a permanent pasture would not need to be taken into account if the pasture was good for years. Permanent pasture was, after all, an expensive mixture of grasses as against the native grass. The Mr. Graham referred to by Mr. Cheesman might be on low ground. If good grasses on low land be got to mature at different periods, the probable results would be good so far, but the question was how long the majority of grasses would last. In Oxford they top-dressed their pasture land.

Mr. Wark did not think it wise to go to the expense of a mixture of grasses, unless there was a fair probability that the pasture would last.

Mr. Wettlaufer said that Mr. Cheesman had referred to soiling as a method which was still under experiment. He would like to ask how many acres it took to keep a cow by soiling.

Mr. Cheesman thought from three-quarters of an acre to an acre and a-half, according to circumstances. Continuing the permanent pasture discussion, he said: Mr. Drummond, of Montreal, sowed a permanent pasture of mixed grasses fifteen years ago, which had been a success. Mr. Drummond used largely in addition, however, concentrated food.

Prof. Mills thought that England and Scotland and their grasses were no criterion for Canada and the pastures here. From his observation of pastures of mixed grasses the spear grass and white clover crowded out everything else in a few years.

Mr. Cheesman agreed with the first remark of Mr. Mills. Even in England the grasses and climate varied largely. Rain fell in twice the quantity in the Midland district that it did in the London area. In response to a question, he said he thought Mr. Drummond had twenty-five grasses living and growing after thirteen years.

Prof. Panton had often thought lately of making a collection of the grasses of the Northwest, and of ascertaining their nutritive value. He believed it would be of more practical benefit to experiment in pasture with the grasses of the Northwest than with those of England and Scotland. The climate of the Northwest more nearly approached ours than in the latter countries, and the grasses were hardier and better suited for Ontario.

Mr. Stover thought the natural grasses of Ontario would, after all, have to be depended on for permanent pasture. In the Northwest the grasses were very fine, and also in Montana, Nevada, etc. In Arizona and California these were not so good: they could not stand the winter so well.

Mr. Holterman believed Prof. Panton's idea was a good one. He had been over the Northwest. They had gravelly ridges and low lands in the Qu'Apelle valley country and lighter land nearer Winnipeg. There was a great variety of soil and climate up there. Grasses that do well in the Northwest ought to do better here. In the Bow River district he saw magnificent grass; in very dry seasons the Qu'Apelle and Regina grass would dry out, while Bow River would have a fair crop, and in a wet year there would be a perfect mat of rich grass. He believed the grass seeds from the Northwest would be found better adapted to our soil than any other.

Mr. Ramsay understood that the grass out there would not grow if nibbled close by horses or other animals.

Mr. Cheesman said sheep had been pastured in grass there for three years without it suffering harm.

Mr. Ramsay had heard that if a horse was tethered for the night the grass which he nibbled close would grow very slowly again, if at all.

Mr. McCaig thought that it would be a similar case to the clearing the ground of grass by fire. It was agreed that after a fire the grass would grow as well as ever.

Mr. Sharman said that in some districts the only grass they had was around the sloughs. If this grass was close cut, the second season there would be a worse crop, and the third season there would likely be none at all. After burning, grass would not be worse next season; good hay resulted from the effect of the burnt and dead grass on the soil. The cattle chiefly browsed around the sloughs; in the valley these were chiefly weeds.

Mr. Evans was anxious to know about the results of permanent pasture, and how many kinds of grasses were sown. On his farm he had a grass which came up after everything else, and which they therefore called after-grass. It was not the red top, nor the blue grass, he did not know what it was, but he considered it worth studying in reference to its benefit to cattle for dairying purposes. He had twelve or fifteen different kinds of grasses in his pasture, yellow clover, alsike, timothy, red top, blue grass and others. His neighbors would not break up their pastures. He had nine acres in pasture: the seed came up well in two years.

Mr. Stover had had considerable experience with this after-grass. It seeded in July and August and formed a natural permanent pasture, and would keep more cattle with a better flow of milk than anything else. On their land, which was what is called "black ash swales," the cattle would gain flesh in September and October, although the pasture looked very dry.

Mr. Evans considered white clover the standard grass. He believed there were more seeds on the roots of the white clover than in the heads after the heads had turned brown.

Mr. Jeffs thought that this after-grass was only the Kentucky blue grass under another name. On different soils the blue grass took different colors, such as red and almost yellow.

Prof. Panton thought also that this after-grass was the Kentucky blue grass. He explained that the bulbs on the white clover roots did not contain seeds, but would produce plants. These were called latent buds.

Mr. Evans was still of opinion that the after-grass was distinctly different from the blue grass. He had seen the latter in various parts of the United States and Canada and did not think this was the same.

The President here deemed it wise to close the discussion.

## STOCK-RAISING FOR ONTARIO.

Mr. W. J. Stover, of Norwich, read the following paper :

Whole volumes have been written on the various branches of this theme. "Best Breeds of Cattle," "Best Means of Improving Stock," "Scientific Feeding," etc., have been much discussed and with valuable results; but the more practical questions of detailed management have been in a measure overlooked.

Ontario adapts itself more safely to mixed husbandry than to specialties; consequently it involves us in more complications, and makes our pursuit more indefinite. We find it necessary to direct our attention to such productions as may be best adapted to the locality and size of the farm, while at the same time we are often obliged to vary our system of management to suit unforeseen changes of circumstances. In stock-raising, one of the most difficult problems is how to keep stocked to just the right number that can be managed to the best possible advantage. In this age of close competition we cannot allow much margin. It is necessary to manage with the closest economy; and to determine what will give the best result is often a serious question.

With the advantage of purchasing their stock for feeding from the ranges farther south and west, the farmers of the Western States have at the present day advantages over us. They are not put to the expense of providing room for so much young stock, and those which they do raise from breeding are kept through the first two years at much less expense. Within the last few years the surplus of ranch cattle has increased to such an extent as to more than fill the demand in western markets, and they are now looking to the east for outlet—consequently we have the wholesale western production to compete with, and so long as they can raise such vast numbers at but little more expense than the cost of herding, they can undersell us and still realize a decided profit.

But, with all its disadvantages, stock-raising is an essential and important branch of industry to the Ontario farmer, and by no means unprofitable under thorough and scientific management, even though the returns may be largely indirect. A practical and comparatively minute experience in stock-raising and management having recently come under my own personal observation; I have thought it might be of value to stock-raisers in general, and therefore endeavor to give here some ideas gleaned both from observation and experience.

In beginning our preparations for stock-raising, the first necessary arrangement—the providing of buildings and stable-room—was the most expensive, and proved to be one of the most important items of consideration connected with farming. Buildings must be convenient, and the stables must be warm, well ventilated and comfortable. The convenience of management in our own buildings is such that one man can attend to sixty head of cattle, do all the stable-cleaning and preparing of food, with help only to do the straw-cutting. On the barn there is a wind engine—a wheel of sixteen feet diameter—with which all the power work, except threshing, is done. The first cost of this machine is the only cost, and it stands in readiness to be used at any time when the wind is blowing. The greatest importance of this is, that the straw-cutting, grain-grinding, etc., can be done in weather unfit to work outside; no fuel, no time in preparing to start, and no horses being required. Horses, of course, have little else to do in winter as a rule, and can work on the power, but in the early winter when it is muddy, and in spring when the horses and hands should be at other work, the wind power is invaluable. The stable is cleaned by means of a dump car, working on a track similar to that of a pitching machine, and the manure is all piled under a shed where it is saved and thoroughly decomposed.

The food is all prepared, and dry fodder and uncut hay are used for a change only, which is very necessary. When depending on hay as the principle coarse food for cattle, I consider it only a useless expense to cut it; for the object in cutting fodder is not so much to improve the quality as to make it more palatable, and when mixed, much rough food is eaten which would otherwise be wasted. But the most important feature in our feeding experiment is this: Three years ago we commenced a system of cooking the food with cold water, that is, we made it soft and moist by simply wetting it and allowing it



to heat and soften by partial fermentation. This experiment was carefully managed and noted through the first winter until we learned how much water to use and the length of time it should be allowed to lie before feeding, and now we practise the system altogether, being fully convinced of the success and value of our experiment. The food is prepared in different lots and in quantities to suit the number of cattle, so that some is being prepared while another lot is being used. The food must be fed as soon as it begins to get warm, and used up before it gets old or sour. Stock will eat the driest of straw when prepared in this way; they relish it and thrive on it, and we find that it is much cheaper to use such food and add small quantities of grain, bran, etc., to give a nutritive ratio equivalent to that of a whole food, than to feed so much hay and more expensive food. I consider roots well worth raising, and a valuable food when used with coarse and rough fodder, and prefer them freshly cut, and thrown upon the food in the manger immediately after it is put in. The meal seems to give better results when fed with other food, as it takes the animal longer to eat it, and it is more thoroughly masticated and better digested. As convincing evidence that this system of wintering is more profitable than the ordinary plan of feeding uncut dry food, we are now keeping a larger number of cattle, have sold from thirty to sixty tons of hay annually, while previous to this we sold none, and are raising as much of other kinds of grain as before.

It is a mistake to have calves coming too early. March and April calves are early enough, and can be raised at a better profit than those coming at any other time. Although it is an object to have early calves that they may look well and do well in the fall, it is more than overbalanced in fitting the cow and feeding for a proper flow of milk so long before grass grows. Calves should never be allowed to run with the cow. Keep the calf in a box stall and let the cow with it regularly three times a day for the first month, and twice a day after until weaned. They will not fret, they will learn to eat other food earlier, they will become quiet and more easily handled, and when the time for weaning comes, the cow and calf will not worry themselves poor by bawling two or three weeks. If a cow is to be allowed to raise calves she should be milked the first year, for then she can be milked at any future time.

For the summer management we necessarily have the permanent pasture system prominent. I am satisfied—although we have not given it a full and thorough test—that the best possible system of management for cows in summer would be soiling and permanent pasture together. My ideal system, and the plan which we are preparing to make thoroughly practical, is to keep the cattle in the stable after the hot weather and flies come on, and let them out at night only. A good, permanent pasture, in which to turn them at night, will allow sufficient exercise, and they are contented to stay in and eat in the day time, and will do much better there than in the hot sun switching flies. In this way a larger number can be kept per acre: they do not waste flesh and shrink in milk from fighting flies in the hot sun, and there is an item gained in the value of the manure. It often occurs in a wet season, or when much new land is seeded, that the meadows and stubble fields yield a large amount of pasture, which must necessarily be eaten off or the crop may be injured. In such instances the cattle may have the range of it for a part of the day, and less other food is then required. It can generally be estimated at the beginning of the season what the amount of such surplus food will probably be, and the number of cattle should be regulated to correspond, or a smaller amount of forage crop can be raised.

In conclusion, whatever the system of feeding and management may be—whether dairying, breeding or beefing—never keep one animal more than can be kept well; always keep as many as can be kept right, and always aim to improve the breeding of the herd. Feed every pound of grain to some kind of stock so long as it will return a price equal to its market value. Grain cannot be raised without straw; then make the best possible use of the straw, and let what cannot be fed go for bedding, and return it to the land. The land will then produce more grain, which is all marketed and its value received indirectly. Remember that breeding for fancy prices is a specialty. Breed carefully, and keep only the best stock. Calculate the profits derived from the direct value of the animal, but if enterprise and superior breeding will make them bring fancy prices, so much the more profitable to the breeder.

Mr. Stubbs was very much pleased with the practical nature of the paper and the valuable hints contained therein. He fully agreed with Mr. Stover as to the strength of western competition, and the disadvantages they labored under as compared with their western friends. The long season for stall-feeding in Ontario was against them, as the cost of it was heavy, they had to have more expensive and substantial buildings, and where in the Western States one man could take care of one hundred cattle, in Ontario they had to have three. Of soiling he had had no experience, as he had sufficient pasture land. He would think that it would cause considerable expense and trouble at the busy season of the year. As to the stabling of cattle in summer, there was also here the expense necessary and the time taken up.

Mr. Stover did not wish to be understood as recommending soiling and permanent pasture. He intended, however, to try and make these systems practicable. The experience of the States was in their favor.

Mr. Ramsay liked Mr. Stover's plan and arrangement of building, and also of getting sufficient power from the windmill to do all the work of cutting, pulping, and other food preparation. He would ask Mr. Stover whether there was much gain in cutting the straw and rough feed and feeding it with other food, or whether the cattle were not after all well enough without it?

Mr. Stover's experience had been that by preparing their food in the way he had spoken of and feeding some coarse food they could keep more cattle than under the old method and have the land as well cropped. He fed oat straw and fine wheat straw. They cut just what they thought the animals would require. He advocated the raising of roots and feeding them with the coarse stuff in this way.

Mr. Stubbs did not believe in feeding uncut straw and meal and ending up with dry hay. He thought the cattle would eat cut straw and meal to better advantage.

Mr. Stover was inclined to be doubtful of the value of cut straw and meal when fed dry. They moistened and softened their feed in the feed-room and the cows came readily to their mangers to eat it.

Mr. Jeffs used cut stuff, mixing it well with other foods in feeding. The cattle did not relish it so well without the cutting.

Mr. Ramsay contended that straw was straw no matter how you cut it and prepare it. Nature teaches an animal to eat only enough crude fibre to make meal digestible, no matter in what shape it was. He did not see any gain in nutrition in change of shape or preparation.

Mr. Stover still maintained that the moistening and warming of the cut stuff and meal had a beneficial effect; it was more easily digested.

Prof. Grenside was disposed to agree with Mr. Ramsay. He could not understand any gain or change in nutrition by such preparation, but believed there might be a gain in its action on other foods. There was very great benefit to be derived in mixing coarse foods, such as hay, straw, etc., with concentrated foods like grains, etc. He was anxious to know what management Mr. Stover had for ventilation, temperature and moisture.

Mr. Stover had found ventilation a difficult matter, and they were not satisfied with their progress in that regard. They differed in opinion as to temperature at home. Personally he was in favor of a temperature of from 40 to 50 degrees, though theirs was kept up to between 50 and 60. They had too much moisture. They overcame this to some degree by lowering the temperature of the stables for a short time in the morning.

Prof. Grenside said that the ventilation of the new stable at the Model Farm had been carefully studied, but yet it was very imperfect. The difficulty could be obviated by having artificial heat in the building as the draft caused by the ascent of the heated air would draw away the bad air, but they have no artificial heat. They could not prevent a down draft. A low temperature was not advisable; he considered about 60 degrees the right thing: the stock would lose heat of body if the temperature was over 60. They had contrived a tin pane for the introduction of fresh air into the Farm stables, which caused the cold air to rise up into the warmer air and not strike directly on the animals. They should have some means, however, of producing an upward draft. He had heard of a revolving wheel for this purpose. The warm air ascends to some extent but cools before

getting far enough. Overcrowding should be carefully guarded against ; each animal should have 1,000 feet of atmospheric space.

Mr. Holterman would inform them that the bee-keepers were ahead of the stock raisers in the matter of ventilation, as it was of more importance to them. They ventilated their repositories by an underground pipe, in dimensions one foot square for every one hundred colonies. This pipe takes the fresh air from outside and when it reaches the repository this air is as warm as the inside air. It is continued up in the repository, and an extra pipe conveys the cold air into the current of warm air which carries it off. Some bee-keepers use a small stove and pipe.

Prof. Grenside agreed if artificial heat were used there would be no difficulty. He wanted to know something more about this pipe and why they considered that it produced an upward draft.

Mr. Holterman explained that the pipe brought the pure air from the outside, and no matter what temperature the air might be when it entered the pipe, the underground passage warmed it and when it entered the repository it was the same temperature as the inside air. They had tested the upward draft by the bee smoker and the smoke from it could be seen ascending in the current of warm air.

Prof. Grenside held that the smoke ascended naturally on account of its being heated.

Mr. Holterman contended on the other hand that the heat of the smoker was very insignificant, and the smoke would lose its heat at once by contact with the air.

In answer to questions from Prof. Mills, Mr. Stover said they found the preparation of their food by cutting, mixing, moistening and warming, better and more productive than the old method ; they fed their hay uncut. He was going to experiment in soiling and permanent pasture for summer management of cows.

Mr. Hobson advocated soiling. He had found that a crop of corn would give good results with calves, and he had no doubt it would be best with cattle too.

Mr. Stover admitted that the fear of stable cleaning had hitherto kept them from adopting this method.

Mr. Laidlaw replied to a question from the President by saying that for beef, the best time for calves to come was in March or April, but for breeding purposes, they should come late in the fall or early in the winter.

Prof. Mills added that they should select and breed from the best, and procure the choicest males to breed from.

Mr. Stover explained to Mr. Ramsay that their windmill was built to give four horse-power in an eighteen-mile wind. He considered it the most economical and practical power for farm use. They purchased one which was highly recommended, but it did not work, so they tore it down and built one of their own, which gave good satisfaction. It had a 16-ft. wheel and a 40-lb. hopper.

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### QUESTION DRAWER.

An interesting feature of the day's proceedings was the reading and discussion of the following queries dropped into the "Question Drawer":

What is the best method of destroying what is known as couch grass? Does Italian rye grass turn to couch grass in time?

Prof. Panton could answer the latter half of the question. Italian rye grass would not turn to couch grass. It would be a case of degradation of grain, should such a thing be possible.

Mr. Hobson had met with half an acre of couch grass in the valley of the Ottawa. Mr. Shaw, who was with him, could, however, tell them better about it.

Mr. Shaw said that in the east the couch grass was regarded as a terrible plague. There was quite a bit of it down there, but not near as much in the west. It was the worst enemy in the form of a weed the farmer met with. On the farm of Mr. Graham, near Ottawa, he and Mr. Hobson had seen a plot of this grass. Mr. Graham was much troubled with it. His plan was to plough it up, go thoroughly over it with a harrow.



rake in heaps and burn. He then sowed a hoed crop, but saw traces of the grass afterwards. He had shortly after met a man who said he kept the grass under, but could not get rid of it. His way was to summer fallow, plow lightly several times, turn up the land well on the approach of dry weather, then fallow in the ordinary way with a grain crop, seeding down with grass, and for three or four years plowing light after harvest and then before winter.

Prof. Brown believed this couch grass was like the rack of the old country. If so it should be got up bit by bit and no small pieces should be left.

Mr. Rivers also agreed that it was similar to the grass that had given so much trouble in the old country. Those who once saw it would easily recognize it. His English hired man noticed it on their farm and advised him to get rid of it at all cost. They plowed and harrowed and then went over the land carefully and threw out every scrap they could find. They then plowed and harrowed and sowed with turnips, and the turnip hoeing in the fall made away with the last of it. No half-way work would turn it out.

In reply to Mr. Morgan, Prof. Panton said that the couch grass was something similar in appearance to the ordinary grass, but its roots were jointed and fibres were thrown out from each joint which spread all around. Its joint was like that of spear grass, and its head like wheat. The roots in a plot were matted in every direction.

Mr. Wettlaufer said that two farmers near him were troubled with this grass. One, however, cultivated his land and grew good crops, while the other had hard work to raise anything off the fields in which the couch grass had appeared.

Mr. Hobson understood Mr. Graham had spent \$150 in forking, plowing, etc., trying to root out the couch grass on the plot they had been speaking of. The best farms would be soon ruined by it, if it was allowed to get ahead.

Mr. Simmons said he was raised in Northumberland county and he left it because the soil was too poor for him. The couch grass, or twitch grass, as they call it there, made a very fair pasture. He would advise anyone not to let it get on good land; this grass on light soil would form a solid mat. Prof. Brown might investigate it with a view to mixing it with his grasses for permanent pasture, for it would hang out if none of the others would. (Laughter.)

Mr. Shaw asked for a method of driving couch grass out of large fields.

Mr. Raynor said some farmers in Prince Edward county sometimes looked on it in the light of a blessing, as it made them work their land more to get rid of it. They plowed shallow with the long plow, then gang plowed it and sowed buckwheat, sometimes plowing it in. The buckwheat smothered the couch grass. Another way was to gang plow, plow, harrow and fallow with the cultivator, then go over with a horse-rake. What was left of the grass would be killed by the frost after it has been ridged up in the late fall.

Does wheat turn to chess or chess to wheat?

Prof. Panton said that all science affirmed that wheat never changed to chess, or chess to wheat. He had met men who believed that sometimes wheat turned to chess. A man had told him that if wheat was sown in July and the frost of the following winter killed it they would have chess the next summer. Another man said that when wheat had been frozen on low lands there was always a lot of chess next summer.

Mr. Stubbs thought the man who did not sow chess would not grow chess. The man who believed wheat turned to chess would take no pains to get it out of his seed and keep his field clear.

Mr. Stover at home had had to stand alone in arguing that wheat did not turn to chess. Last spring, however, they had stood the seed drill in the implement shed after sowing wheat, and at each point of the drill little bunches of chess sprung up. He could not believe that wheat produced chess, but after that he had quit arguing the point.

Where may concrete walls be used for stables, and are they durable?

Mr. Hobson said Mr. Seagram, the distiller, had built \$20,000 stables near Waterloo. He had built his walls of concrete, and they were now giving away. He was propping up his roofs until he could build up with brick in the spring.

Mr. Wettlaufer considered a concrete wall close to the ground a failure.

Mr. Havers had asked the question. His son was living near Lake Erie, and was disposed to use concrete, as stone was \$6 a cord laid down. He was building against a bank.

Mr. Ramsay had had a little experience in concreting. Some say that one part of lime should be used to twenty of gravel, but he has found better results from a proportion of one to four or five. Concrete did not do under ground; it was good, though, for cross walls. It should not be used around a bank.

1. Which pays the best, spayed heifers or steers? 2. Can spaying be successfully carried on among pigs and cows or heifers?

Dr. Grenside answered the questions\*as follows: 1. Experiments were under way, and he could not speak definitely yet. Spayed heifers were better for the market. He believed it would be good for sows and other animals. Dishorning was not of much use. 2. Yes. Spaying might also be applied to mares.

Would Mr. Cheesman kindly tell us how Mr. Dawes, of Lachine, makes his ensilage?

Mr. Cheesman explained that the crop was sweet corn. It was sown the first week in June, worked with the cultivator and fertilized with about twenty loads of farmyard manure and five hundred pounds of Stanker fertilizer. They harvested forty tons in the second week in September. This was cut into three-quarter inch lengths and trodden into the silo slowly.

Will anyone offer an explanation of the following circumstance, which the experience of many others bears out? We had eight acres laid down to clover, first season's growth. About the middle of May we turned in several head of cattle and a number of horses. We noticed that the animals persisted in eating every blade of grass which they could find. The ground was cropped bare in every corner of the fence and in the lower places of the field where timothy would grow. The clover was left to be eaten at the last extremity.

Before the meeting adjourned, President Mills invited all present to proceed to the dining-hall of the College, to partake of the Matron's hospitality, after which various toasts were proposed and fittingly responded to by members of the Union and others.

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## SECOND DAY.

The Union resumed on Friday morning at 8.30 o'clock.

### ELECTION OF OFFICERS.

The nominating committee presented names to be balloted for, to occupy the different offices, and the election resulted as follows :

Honorary president, James Mills, M.A.  
President, R. F. Holterman, Brantford.  
Vice-President, J. B. Muir, North Bruce.  
Recording Secretary, H. B. Sharman, O.A.C.  
Corresponding Secretary, W. J. Stover, Norwich.  
Treasurer, T. Raynor, Rose Hall.  
Editor, C. A. Zavitz, O.A.C.

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### DISTRICTS AND SECRETARIES.

The Committee on the division of the Province into districts to facilitate and increase the interest in the Union presented their report which was adopted, and the following district secretaries elected :—For District No. 1, comprising Stormont, Dundas, Russell, Glengarry, Prescott, Cornwall, Carleton and Grenville, J. A. Craig, Russell ; District No. 2, Lanark, Renfrew, Leeds, Frontenac, Lennox, Addington, Hastings and Prince Edward, T. Raynor, Rose Hall, Prince Edward Co. ; District No. 3, Nipissing, Parry Sound, Muskoka, Haliburton, Peterborough, Northumberland, Durham, Victoria and Ontario, S. P. Brown, Whitby ; District No. 4, Simcoe, York, Peel, Dufferin, Grey, Wellington and Halton, F. J. Sleightholm, Humber ; District No. 5, Wentworth, Lincoln, Welland and Haldimand, G. Harcourt, St. Anne's ; District No. 6, Waterloo, Oxford, Brant and Norfolk, H. Dean, Harley ; District No. 7, Huron, Perth and Bruce, J. H. Esplin, Burgoyne ; District No. 8, Middlesex and Elgin, H. A. Morgan, Kerwood ; District No. 9, Essex and Kent, J. J. Sinclair, Ridgetown ; District No. 10, Lambton, A. E. Wark, Wanstead.

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### INCORPORATION.

The question of incorporation was then brought forward by Mr. Holterman, who explained the advantages that would accrue from such a step. President Mills, Prof. Brown and Deputy Commissioner of Agriculture Blue also spoke, the latter giving the general requirements necessary to be fulfilled before incorporation was sought. It was finally carried that Prof. James, Messrs. Raynor and Holterman be a committee to carry out the intention of the Union in regard to incorporation.

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### WORK OF THE UNION.

The following paper by Prof. James, Ontario Agricultural College, was then read :

The live man must possess something more than life—animal life. He must not simply *be*, he must also *do*. From time to time he will stop, sit down and consider, and submit to himself a few questions : Why am I in this world ? What is my purpose here ? What claims have I upon this world ? What claims have the world upon me ? Am I improving myself and others ? Am I filling a place here that no one else could fill but myself ? This may not be an inappropriate time for us as a society to submit a few such questions to ourselves, and to consider just what we are here for, what we are doing and what our aims and prospects are. Unlike the man who was not responsible for his



existence in the world, we as a society, are responsible for our existence; and further, in common with each individual, we are responsible for the proper use and development of the powers and capacities given to us and within our reach. As a Union we have no moral right to remain organized as we are, unless we show some good results and do the very best we can, both for ourselves and for the cause under whose patronage we are organized—the cause of Scientific Agriculture.

The right to be, as I have above stated, lies in the aim and object of the Union. Such work, and only such work, should be attempted and can be more thoroughly done by combined effort than by individual exertion. The fostering of mere sentiment will not be sufficient to bind you together firmly or permanently. Love for and interest in this Agricultural College must not be the only or principal aim of your organization. If you would keep that sentiment warm, if you would attract the attention and win the commendation of the agricultural and scientific class, you must accomplish something; your fruits will attest your vitality and growth.

That there is need of such a Union as this, really doing the work it proposes, no one can question. The study of agriculture is opening up one of the widest fields for scientific research, and it is possible if every man stands true, if every man is willing to sacrifice a little in a good cause, if good common sense directs your movements—that in a few years you will achieve a position beyond your present most hopeful anticipations. The future lies in this. There is no limit to your possible development, and you can make yourselves what you like. Think great things for this Union, and *do them*. To a band of young men who have received an impetus along the line of scientific investigation, and who have well rounded out their education by the various studies set down in our course, I know of no more promising or attractive field of work than that which opens before you. If you have not accomplished much in the past, remember the future is as yet untried. Remember also “He who aims the stars, shoots higher than he who aims a tree.” Place a high ideal before you, resign yourselves to hard work, continued work: permit no discouragement. Cultivate a social spirit among your members, take second place to no society in this country, and not being overburdened by pride or selfishness, go to work and accomplish even more than you expect.

Of the past work of this Union I know but little, and therefore shall say nothing beyond a reference to the work of the past season.

#### EXPERIMENTS CONDUCTED IN 1886 BY MEMBERS OF THE EXPERIMENTAL UNION.

The object of the experiments was to test the effects of salt, gypsum or land plaster and superphosphate upon wheat, oats, and barley. The plots were one-fortieth of an acre in area in each case. The cereals sent out were 12 lbs. of White Fife wheat,  $8\frac{1}{2}$  lbs. of six-rowed barley, and  $7\frac{1}{2}$  lbs. of Black Tartarian oats, each for four plots or one-tenth of an acre. The fertilizers were—10 lbs. of salt, 10 lbs. of gypsum, and 10 lbs. of superphosphate. The analysis accompanying the superphosphate was as follows: Phosphoric acid, 13%; ammonia, 2%; potash, 14%. Each experimenter would therefore have wheat, oats or barley, growing on four similar plots, treated as follows: (1) No manure, (2) salt, (3) gypsum, (4) superphosphate. Grain and fertilizers were sent to twelve members of the Union, wheat to four, oats to four, and barley to four. Eight completed the experiment, and reported in full.

The experimenters were requested to observe and report upon the following points:

1. Previous cropping and fertilizing.
2. State of soil and condition at time of sowing—date of sowing.
3. Time of appearance of grain in each plot.
4. General growth and comparative condition of grain on four plots from time to time.
5. Date of maturity and harvesting.
6. Weight and condition of straw and grain separately.
7. General observations of the weather.
8. Conclusions as to the value of each of the fertilizers.

No.	Experimenter.	Grain.	Fertilizer.	Straw in lbs.	Grain in lbs.	Total.	Soil.
I.	J. B. Muir, Bruce Co. ....	Wheat ...	No fertilizer .....	46—10lbs chaff	32	88	Clay loam to clay, with clay sub-soil.
		" ...	Salt .....	42—10 "	34	86	
		" ...	Gypsum .....	44—9 "	33	86	
		" ...	Superphosphate ..	50—8 "	34	92	
II.	J. G. McKay, Bruce Co. ....	Wheat ...	No fertilizer .....	73	21	94	Clay loam.
		" ...	Salt .....	60 $\frac{1}{2}$	19 $\frac{1}{2}$	80	
		" ...	Gypsum .....	73	21	94	
		" ...	Superphosphate ...	66 $\frac{1}{2}$	16 $\frac{1}{2}$	83	
III.	E. M. Zavitz, Middlesex Co.	Wheat ...	No fertilizer .....	57 $\frac{3}{4}$	23 $\frac{1}{4}$	81	Clay loam inclined to loam, gravel subsoil.
		" ...	Salt .....	77	36	113	
		" ...	Gypsum .....	62 $\frac{3}{4}$	27 $\frac{1}{4}$	90	
		" ...	Superphosphate ..	58	23	81	
IV.	T. Raynor, Pr. Edward Co (See notes below.)	Barley ...	No fertilizer .....	8	12	20	Clay loam.
		" ...	Salt .....	10 $\frac{1}{2}$	15 $\frac{1}{2}$	25 $\frac{1}{2}$	
		" ...	Gypsum .....	10 $\frac{3}{4}$	14 $\frac{3}{4}$	25 $\frac{1}{2}$	
		" ...	Superphosphate ..	9 $\frac{1}{2}$	13 $\frac{1}{2}$	22 $\frac{3}{4}$	
V.	Geo. Charlton, Brant Co. ....	Barley ...	No fertilizer .....	35	35	70	Clay loam, with clay sub-soil.
		" ...	Salt .....	43	39	82	
		" ...	Gypsum .....	43	37	80	
		" ...	Superphosphate ..	43	38	81	
VI.	C. A. Keil, Chatham .....	Barley ...	No fertilizer .....	39	42	81	Rich alluvial soil.
		" ...	Salt .....	28	33	61	
		" ...	Gypsum .....	28	31 $\frac{1}{2}$	59 $\frac{1}{2}$	
		" ...	Superphosphate ..	34	35	69	
VII.	E. Lick, Ontario Co. ....	Oats .....	No fertilizer .....		32 $\frac{1}{2}$		Poor clay loam, inclined to gravelly nature.
		" ...	Salt .....		32 $\frac{1}{2}$		
		" ...	Gypsum .....		26 $\frac{1}{4}$		
		" ...	Superphosphate ..		32		
VIII.	A. L. F. Lehman, Simcoe Co.	Oats .....	No fertilizer .....	23—4 chaff	31	58	Clay loam.
		" ...	Salt .....	20—4 $\frac{1}{2}$ "	28.5	53	
		" ...	Gypsum .....	22—8 $\frac{1}{2}$ "	21.5	52	
		" ...	Superphosphate ..	22—5 "	26	53	
		" ...	Farmyard manure, 20 tons per acre.	33—6 "	33	72	

Average of experiments on—	Experimenter's Nos.	Fertilizer.	Straw in lbs.	Grain in lbs.	Total in lbs.
Wheat .....	I., II., III.	No fertilizer .....	62.25	25.42	87.67
		Salt .....	63.17	29.83	93.00
		Gypsum .....	62.92	27.08	90.00
		Superphosphate ..	60.83	24.50	85.33
Barley .....	V., VI.	No fertilizer .....	37.00	38.50	75.50
		Salt .....	35.50	36.00	71.50
		Gypsum .....	35.50	34.25	69.75
		Superphosphate ..	38.50	36.50	75.00
Oats .....	VII., VIII.	No fertilizer .....	27.00	31.75	58.75
		Salt .....	24.50	30.50	55.00
		Gypsum .....	30.50	23.87	54.37
		Superphosphate ..	27.00	29.00	56.00
All complete reports of crops.	I.	No fertilizer .....	47.96	30.99	78.96
	II.				
	III.				
	V.				
	VI.				
	VII.	Gypsum .....	48.37	28.21	76.58
	VIII.	Superphosphate ..	47.58	29.21	76.79

NOTE.—Full reports were not received from the other four experimenters.

## OBSERVATIONS AND NOTES BY EXPERIMENTERS.

J. B. MUIR, North Bruce.—*Previous Cropping* :—Previous to 1886 no systematic course of cropping had been adopted, but corn, potatoes, millet, etc., had been grown upon it from time to time. *Previous Treatment* :—For the past eight or ten years it has been plowed in the Autumn and generally receives from ten to twelve loads of barnyard manure per acre yearly; a small quantity of wood ashes were thrown upon it from time to time every winter. In September, 1885, a light top-dressing of fresh meadow muck was spread and allowed to lie exposed for the winter. *State of Soil, etc.* :—Land selected was in fair state of cultivation and not exhausted by previous cropping. The surface soil varies in texture from a clay loam to clay with heavy clay subsoil; only partially drained; a gentle slope to east and south. In the spring of 1886 weather was wet and cold. Land plowed May 12th, then harrowed, rain prevented sowing till 18th. *Appearance of Grain* :—First blades on gypsum plot on 23rd, on 24th large percentage up in all plots; wheat came up quite thin. *Weather* :—Several frosts early in season, dry in summer. Later on the plots fertilized by salt and superphosphate became more healthy and vigorous looking than the other two, especially the plot where no fertilizer was used. During the latter part of June and the early part of July quite a percentage of this latter plot turned yellow in the leaf and was very unhealthy looking for a time. As the season of growth advanced the salt and superphosphate plots became more uniform and healthy looking than their companions, and after the grain shot out the salt plot seemed to gain on its rival, ripening a day or two earlier, and more evenly; had a brighter, stiffer and healthier looking straw, and when thrashed a plumper and more uniform grain. On 22nd August, wheat on the salt plot was ripe and ready to cut, on 24th all were cut. Had the grain in the superphosphate plot filled out as well in proportion as that from the salt, it would certainly have ranked first in point of yield, as there was a more vigorous growth of vegetable matter from this plot than from any of the others. *Conclusions* :—From the results of this experiment I consider salt to be the most economical and beneficial fertilizer to apply to our land at the present time. It is inexpensive and convenient, may be obtained in abundance in this locality, and would certainly be used profitably, even if there was no greater returns than the improved quality of the grain would secure. Judging by the return from the superphosphate plot, it would not pay to use this fertilizer at present price in our land. Gypsum apparently has no value and is not required by the land in our locality.

J. G. MCKAY, Underwood P. O., Bruce Co.—*Previous Cropping* :—Clay loam; last crop peas; land never manured before; four crops taken off since broken up from sod soil. *Sowing, Weather, etc.* :—Sowed wheat on forenoon of May 14th; it rained 7 p. m. of the same day. Fore part of season (June) was very dry. July 7th—Doing fairly. On July 15th the salt plot headed out, superphosphate plot half headed out, gypsum plot just starting. July 20th—All headed out. August 13th—Heavy hail which hurt the grain, shelling about one-fourth. August 16th—Rain. Salt plot the ripest. August 23rd—Rain all day. August 30th—Salt plot cut. September 1st—Other plots cut; superphosphate plot being a little riper than the gypsum. The salt plot had a little more clay in it than the others.

E. M. ZAVITZ, Coldstream P. O., Middlesex Co.—*Previous Cropping* :—Roots up till last two years, when plots 1 and 4 were under strawberries. Only manure has been barnyard. *Growth of Grain* :—Sowed on April 28th; soil moist and mellow.

Grain on plot No. 1	.....	appeared May 6.
“ “ “ 2	.....	“ “ 8.
“ “ “ 3	.....	“ “ 7.
“ “ “ 4	.....	“ “ 6.

They seemed to keep even until the time of the drouth, when the salt plot seemed to hold out rather the best. *Condition of Grain and Straw* :—The straw of No. 2 was a little the brightest; the rest about the same. After careful examination we concluded that the difference in quality of grain was slight, and in the following order from best to poorest :



Nos. 2, 3, 4, 1. *Conclusions* :—The exceptional drouth seemed to give the salt plot an advantage over the rest. Had it been a wet season the results might have been materially changed, even reversed in some cases. Could we foretell the nature of the season, we might choose more wisely, but under existing circumstances we must draw conclusions from the aggregate of advantages and disadvantages of each fertilizer, not only the aggregate of the dozen little experimental stations of this year, but of a number of years. We feel well repaid for having undertaken the experiments in the insight we have gained in experimenting. We intend to act on the result obtained by sowing the wheat next spring from all the plots and fertilizing with salt.

T. RAYNOR, Rosehall, Prince Edward Co.—*Previous Cropping* :—Barley in 1885, then light coat of farmyard manure. *Soil* :—Clay loam, plowed once in fall and ganged again in spring. In fair condition, but not so fine a seed bed as is desired. Sowed May 4th; plots somewhat wet. I sowed it by hand, but unfortunately got it too thick, although I did not sow by a pound the quantity sent. It was harrowed over twice after the fertilizers had been applied. *Appearance of Grain* :—It was all above the surface in a week, or perhaps less time. No. 4 first showed itself distinctly. The other plots seemed to come up and grow about alike. *Growth of Grain* :—Notwithstanding the fact that the grain was too thick, it grew quite uniformly most of the time. Plots 1 and 2 grew somewhat ranker towards the close of the growing season. Being so thick on the surface, the straw was much finer and the head much smaller than it otherwise would have been. *Maturity* :—About August 1st plot No. 4 had matured four or five days before the others. *Condition* :—The straw was fine, fair in color, and of medium length. That from No. 2 was a little the coarsest, I think. The grain was partly colored and partly bright, about No. 2 extra. It was plump, however, and in other ways a good sample. *The Weather* :—The weather at time of seeding was everything could be desired. The seed sprouted quickly and grew rapidly with the refreshing showers. The weather, changed, however, becoming cold and very backward for two or three weeks, and finally a drought setting in, indicated a short crop. Towards harvesting time the weather became once more favorable, and with the fine warm showers a good crop was harvested after all. *Conclusions* :—From results obtained I must acknowledge the salt to be the best, although I think the positions of plots 1 and 2 were a little advantageous. I do not think that salt acts directly as a manure but indirectly aiding in splitting up other constituents into soluble plant food. Salt has been used before in this vicinity and with good results. The gypsum gave even better returns than the superphosphate. However, as a fertilizer, I think it is much better for leguminous crops than for the cereal crop. There is no doubt in my mind that the superphosphate is a far better manure for barley than the others. It is quick in its action and causes a more rapid growth. A rapid growth means early maturity, and on the whole I am somewhat prejudiced in favor of phosphate for barley. In conducting this experiment, it was discovered when too late, that only one-quarter of the land necessary was taken. This will account for the small amount of grain and straw in comparison with the other experiments. If the result were multiplied by three a fair average would have been obtained.

GEORGE O. CHARLTON, St. George P.O., Brant Co.—*Previous Cropping* :—The soil the previous year was under roots and had farmyard manure applied at the rate of 20 loads per acre. Soil is a clayey loam and at time of sowing was in the best possible condition. *Growth of Grain* :—Sowed May 8th; by May 14th all plots were up equally well. No difference apparent in growth from time to time, except that No. 3 had a deeper shade of green. A difference was perceptible in the time of maturing, No. 2 (salt) ripening fully three days sooner than No. 3, No. 4 maturing sooner than No. 3, but not so soon as Nos. 1 and 2. All were ripe and harvested July 20th. *Condition of Grain* :—No. 1, heads short; straw had a tendency to remain green and the barley contained a considerable percentage of small grains, though of a good color. No. 2, straw bright and stood up well; heads well formed; grain of a good color, plump, and very few of small size. No. 3, same as No. 1, except that the percentage of small grains was less. No. 4, straw seemed soft, had a tendency to lodge and colored rapidly with dew and sun; heads large

and well formed; grain slightly colored yellow, but plump, with few small grains. *Weather*.—During the experiment, the weather was warm and moist first half, but latterly dry and hot, which, I think, was the reason why the yield was not greater.

C. A. KEIL, Chatham.—*Previous Cropping*.—From 1879 to 1885, potatoes (farmyard manure), barley, potatoes, fodder corn, sugar beets, flax (farmyard manure), and oats. Land has been cropped for 25 years, no special fertilizers ever having been used. It is drained by an open creek near by; no under drains. The soil is a clay loam with considerable percentage of humus, having a clay subsoil. The land was plowed April 21st (rather late for us), barley was broadcasted next day, and fertilizers broadcasted afterwards. The ground was not in very fine condition and the weather was very warm. *Growth*.—From date of sowing till harvesting we had very little rainfall, and the barley did not stool out as it should have done. The only difference in all the plots was that the salt plot could be easily distinguished from the others by the whiteness of the straw and grain. It was cut July 21st and threshed Nov. 25th. Although not a heavy crop the sample was good. Salt was No. 1, gypsum No. 2, the other two equal. I also sowed salt on our field of barley and also fall wheat, leaving some strips unsown. I could never see any difference in the growth or maturity, except that the straw was brighter where the salt was sown. The land in this part of the country being of a rich alluvial nature, if moderately well worked and manured with farmyard manure, will yield good crops for a great many years, and I think the benefits derived from special fertilizers would not compensate for their cost. Salt and gypsum would be useful in diminishing the quantity of straw, and salt especially very materially brightens the grain and straw, but superphosphate would not pay. The extreme dry weather may have affected the action of the manures, but it is rather strange that the "no manure" plot came out the best.

ELMER LICK, Oshawa.—*Preceding crop*.—Oats seeded to alsike clover; the portion under experiment winter-killed. In 1884, barley. In 1883, peas on three-year-old sod. A light dressing of barnyard manure was applied in fall of 1883. *Soil*.—It is a poor clay loam inclined to be gravelly. It was plowed May 14th, was very wet owing to spring rains and low situation. *Growth*.—On May 17th, oats and fertilizers were sown. June 23rd—A much darker and more luxuriant growth could be noticed in the superphosphate plot. Dry weather following, the salt soon gave the best appearance. After every rain a very noticeable improvement could be seen in No. 4 plot; no difference in Nos. 1 and 2. July 22nd—Nos. 1 and 2 headed out; 3 and 4 a few days behind and not looking so well as 1 and 2. Just before harvesting Nos. 2 and 4 were equal in appearance, only slightly better than No. 1. No. 3 was very inferior to the others. August 23rd—Ripe and harvested, no difference could be noticed in ripening owing to rust. *Condition*.—The quality of grain was best on No. 4, then No. 2, No. 1 and No. 3 in order. There appeared to be more straw on 2 and 4 than on 1, and more on 1 than on 3. No. 3 was badly rusted, No. 1 not so badly, and Nos. 2 and 4 were comparatively free from rust. The late sowing and rust account for the low yield (under 40 bushels per acre.) *General Observations*.—The dry summer gave the salt a good chance and hindered the superphosphate from showing the effects of its application. The land was poor, scarcely ever giving over 35 bushels of oats, 20 of peas or 20 of barley to the acre. *Conclusions*.—From the above experiment I would conclude that gypsum was an injury to the crop; that salt would pay in dry seasons through the straw being freer from rust; that superphosphate in dry seasons would not pay for its application. All the above applies to land similar to that under experiment.

A. L. F. LEHMANN, Orillia.—*Previous Cropping*.—Oats preceded by peas. *Soil*.—Clay loam, plowed in fall and spring. *Growth of Grain*.—Sowed on May 8th, appeared on 17th and 18th May. June 1st—Superphosphate and gypsum ahead, then farmyard manure, then salt and no manure. June 15th—Farmyard manure improving. June 30th—Salt and no manure still behind; others even. July 1st—Farmyard manure decidedly ahead and headed out, the others evenly advanced. July 12th—All headed out. August 23rd—Grain matured. August 30th—Cut; rainy weather preceded this. September 4th—Threshed. *General Observations*.—All grain was "dead ripe," except



that on the farmyard manure, which still contained some green stalks. The season was a dry one, with the exception of seeding and harvesting time. *Conclusions*.—My conclusions are that the soil on which I experimented has been deficient only in nitrogen. The farmyard manure was of inferior quality. As clay predominates, I think sufficient potash was present. As far as I know no similar experiment has been conducted in this neighborhood. I was much astonished to find all the special fertilizers have an injurious effect upon the soil on which I experimented; but in a previous experiment with superphosphate on potatoes in sandy soil I found the same injurious effect.

F. WETTLAUER, Innerkip.—*Sowing*.—For the sake of having the seed more evenly distributed, I used a "Wisner & Son seed drill" in sowing the oats, and as I had to set it to a given quantity, I did not get the seed all sown, about one-half pound being left over. However, each plot received the same quantity of seed. April 26th—Plowed land, soil quite dry. May 1st—Dragged, sowed seed, rolled. *Growth*.—May 11th—Grain began to appear; sowed fertilizers. May 14th—Grain well up; came up uniformly on all plots. May 15th—Heavy rain fell last night. May 17th—Severe frost last night; oats slightly touched. May 24th—Plot No. 4 considerably ahead of the others; has a much richer color. Soil on No. 2 looks moister than the other plots. July 5th—Oats heading out; Nos. 2 and 4 fully two days earlier. July 14th—Oats fully headed out. August 3rd—Harvested oats. *Observations*.—In considering these results the following facts should be noted:—(1) That the fertilizers were applied broadcast on the surface after the grain was up. (2) That the only rain heavy enough, during the whole season's growth, to reach the roots fell on the night of the 15th of May. (3) That No. 4 plot gained immediately after the rain. *Conclusions*.—In my opinion the small yield on plot 4 was due to the unusual drought, the fertilizer not having been washed to the roots. The small yield on No. 2 is easily accounted for, the soil being destitute of those materials on which salt generally acts. I must add that there was no appreciable difference in the quality of the grain. Had the fertilizers been well incorporated with the soil I think the results, at least on No. 4, would have been better.\*

The membership of this Union must be made up of workers—there is no room for drones in the hive. Bring on every good man you can. Make extra effort, again and again, to enlist the sympathy and co-operation of every good man that has gone out from this College. You cannot afford to be without them, and at the same time you cannot afford to hold on any who have neither strength in themselves nor interest in your undertakings. I may be speaking plainly when I say that it is better for you and the half-hearted members to part—better for you and better for themselves. You can accomplish more with six earnest, careful workers than with twelve half-hearted, careless ones. Aim, then, to bring together a band of intelligent, careful, enthusiastic workers, upon whom you can always depend, and whom you can always rely upon being in their place at the right time. Your general aim is to collect FACTS; you must undertake new work, review and confirm former work, patiently collect statistics from year to year, publish them, and wait until you have sufficient results to deduce general laws in which confidence can be placed, and to which your reputation for careful work will give reliability. To collect facts is no easy matter, for there are facts and facts. There is a looking at an object without seeing it, and there is a seeing of objects which do not exist. Collect the true facts bearing on agriculture developed in your experiments and ordinary work, and the theories and law will gradually reveal themselves. This Union, then, should be the means whereby every member makes public early the valuable observations and conclusions of his year's work.

Work can be undertaken in two ways, either individually or collectively. Of course the aim of a union is to do united work, but, at the same time, there should be a place for individual work as well. All are not so situated as to be able to work in the same lines; it should be considered as a necessity of continued membership that each man attempt some experiment at least once in every two or three years. If you are true members you will bring in or send in each year some result of work, and contribute something, little though it may be, to the report of the year's work done by the Union. Do not think any

\* Owing to the lateness when this report came in no comparative table is given.

result accurately obtained too insignificant to be presented. The most valuable and interesting part of this annual meeting might be the reading of written reports of individual members upon experiments carried on independent of the general work. For instance, one man might report on an experiment in cattle feeding, giving the daily ration and the results obtained; another, some observation in fruit growing, the improvement of a tree or vine, the appearance or disappearance of some new or old injurious insect; another might make a collection and send in an illustrated paper on the weeds of his district; another, on the use of some special fertilizer; another, on the ingenious devices and improvements noticeable from a visit to the most improved farms in his district, and others on the thousand and one points to be observed by those who wish and are willing to make a little effort to observe them. Has not some member any suggestion to throw out in regard to this at the present meeting? Are there no observations that any one would like to have made by those who are in a position to make them, and which can be reported upon at the next annual meeting?

If you are desirous of interesting work, and are bound to do it, you need not be idle—here as everywhere, “Where there’s a will there’s a way.” If this Union accomplishes one of the principal objects for which it is established, it will undertake and carry out some comprehensive work, perform experiments, whose combined results can be tabulated and published. We should not attempt too many or too complicated experiments at first. The results of the past year’s work clearly proved that to obtain accurate information there must be more experimenters, a continued trial, a wider range of soil, climate and time covered. This meeting can either itself decide what shall be the work attempted or leave it to a committee, which, perhaps, would be the wiser, more expeditious and more satisfactory plan. For myself, if I am allowed a suggestion, I think one of the most important and most inviting lines of work would be the continuance of the past summer’s experiments, an investigation of the native fertilizers of Ontario, especially with reference to salt and phosphates. You have now an earlier start and can make much better arrangements than were necessitated last spring by the lateness of the meeting. The work might be undertaken as follows:

A continuance in as many cases as possible of the experiments upon the same plots as were used last year.

New experiments started by other experimenters. We should have at least twenty-five or thirty carrying on these experiments during the present year.

The appointment of members in various districts to gather all the reliable information that they can in reference to the use of the same fertilizers by the farmers of their section, and report on the successes and failures.

The appointment of a few of the students to read and examine reports, write for statistics if necessary, gather all the printed information possible in reference to these fertilizers here and elsewhere, and compile results.

Then to appoint a committee of two or three into whose hands all this information in reference to the fertilizers shall be directed, who shall compile results and put all into shape for the next annual meeting.

Give work to as many reliable men as possible, and the result will be a gradual accumulation of facts on the native fertilizers of Ontario, valuable to the farmers, and a credit to the Union. It should be, and can be, the most reliable work to be found on the subject, and a report eagerly sought for by the intelligent farmers of the Province.

I do not think it necessary for me to dilate upon the advantages of experimenting further than to state among its most apparent good results the following:—

1st. It leads to habits of careful handling, of accurate observation, of true calculation and of scientific method in working.

2nd. It gives a higher status to the calling, imparts increased dignity to the profession, and attracts the attention of the members of the other callings.

3rd. It adds interest to the farmer’s work.

4th. It opens up the only way by which farming is to keep pace with the other rapidly advancing professions.

In conclusion, let me say, that we must look forward, not backward, if we desire inspiration in this work. Let us lay down definite work,—leave this place with every member determined to do something, to leave in the hands of the Union, one year from to-day, something worth recording. Let us be willing to make a little sacrifice for the sake of this cause; let us work harmoniously together, being more desirous of the success of the Union than of mere personal favor or aggrandisement; let us take hold of the plough without meaning to look back, and it may be that in ten years it shall be said of you who are now working for the success of this commendable cause, "They builded better than they knew."

The President complimented Prof. James on the excellence of his paper. It was an exceedingly suggestive one, and, he might say, the best he had ever heard read before the Union. He would ask Prof. James if the committee on experiments had finished their work.

Prof. James thought the committee of last year had ended their work. The compilation and aggregating of the results sent in entailed considerable work, and he would like it a little more evenly divided. A committee should be formed now to decide on the experiments for the coming year.

Mr. James Anderson asked where the superphosphate used in the experiments was procured.

Prof. James said it was manufactured at Brockville, and the published analysis accompanying it gave as two constituents, phosphoric acid to the amount of 13 per cent., and ammonia 2 per cent. He was doubtful, from the results of its use, whether it was so rich as claimed. He could not analyze it then, but he was now in a position to have the work of analysis done before the fertilizers are sent out.

The President thought it would be worth while to consider the question why salt gave better results than superphosphate and gypsum. He was pleased to find that they had got eight full reports out of the twelve. These were very useful. Salt was ahead nearly all through.

Mr. Hobson asked Prof. James to tell why land with no manure gave a greater yield than land with artificial fertilizers. In three or four of the experiments the results were greater.

Mr. Keil said the reason salt gave such good results last year was on account of the dry weather. In his county (Kent) in a dry season the salt kept the ground moist; in a wet season it was of no benefit. In his experience no manure gave better results than special fertilizers.

Mr. Wark could not get over the fact of land not manured giving better yields than land with special fertilizers unless the latter injured the growing grain. He was down on special fertilizers. He believed in farmyard manure and clover. In ten years by their use his land would be in better condition and have given better results than his neighbor with his special fertilizers, and he would have no mortgage, while his neighbor would have one.

Mr. Dennis would add buckwheat along with clover for manure. It should be plowed under when green.

Prof. James reminded them that the question whether farmyard manure was ahead of special fertilizers in all cases was for experiment to determine. He had been asked why the phosphates and the gypsum were behind. He could not explain it. He could only say that a well-grounded failure was just as necessary as a well-grounded success. They had simply to find out facts. They were not to start out prejudiced. In the case of Mr. Keil, of Chatham, the plot with no fertilizer gave the best results; the other fertilizers had an injurious effect. Mr. Keil had omitted to mention the kind of soil in his return. His was a remarkable result.

Mr. Keil was under the impression he had given the nature of his soil in his report. It was a rich alluvial, clay bottom, and subsoil humus. The four plots were side by side in this soil. He found that if his land was properly worked and farmyard manure was used, there was no necessity for any other fertilizers. He favored the use of salt, not



because it increased the yield, but it made the straw brighter and the berry plumper. Using gypsum and superphosphate on his land was throwing money away. Ours is old land worked for twenty-five years; flat, well-drained, three and a-half miles from the river, open ditches, no underdraining; rotation of crops was given in report.

Mr. Wettlaufer had sent in a report but evidently they had not received it as no mention was made of it. There was not much difference in his plots; the superphosphates was a little ahead, the rest were alike. The yield was poor. He had a rich soil, sandy loam, limestone foundation, naturally well drained, but exhausted by continual cropping. The best analysis was by the plant; very little could be deduced by soil analysis.

Mr. Campbell (Halton) used salt on barley. It does well on clay soil. He would agree with other speakers that farmyard manure is best; it was hard to surpass nature. In dry seasons they saw the effect of salt; it absorbed the moisture of the atmosphere. In farming extensively it was hard to get enough farmyard manure. If they had not sufficient, they must get artificial manure. He had used phosphates with good results. Salt was good on barley and oats on clay soil.

Mr. McMillan (Huron) had found salt good on muck land, not only for the stalk but also in the yield of grain. He and a neighbor had cleaned up a swamp on their farms and sown it in grain. He used salt liberally, and his neighbor used none. He had a yield of 34 or 35 bushels to the acre; his neighbor's crop was a failure. On a real deep heavy clay, salt was of little use, but on light land it gave good results. On wheat it gave no noticeable effect, but was a great benefit to oats. Salt was a physic, and should not be used regularly. He would suggest that in the next year's experiments the amount of rainfall and of sunshine be noted and reported, as in different localities in one season these varied very much.

Mr. Simmons (Middlesex) believed that in the level land and rich soil of the County of Kent, with farmyard manure and proper cultivation, a man could have a steady crop for fourteen or fifteen years. It was a rich part of the province near Chatham. When the straw is disposed to be weak and gets down a judicious use of salt was beneficial; it should be used occasionally. In raising mangels and carrots salt was good, but he had not found it a success on turnips. By the use of a little salt each year he secured big crops of mangels.

Mr. Shuttleworth suggested that the result of the use of salt, whether regularly or occasionally, might be taken up in their experiments. It might be wise to confine their experiments for the coming year to salt alone.

Prof. James said they could decide whether to confine to salt or to continue their present experiments. Many farmers say they get good results, but what they wanted was accurate results. Without these they could not draw conclusions. The use of farmyard manure with salt, or without salt, was also worth studying.

Mr. Ramsay wanted to know whether salt was good for leguminous crops, as well as cereals. He did not believe it was any use on the former; gypsum was better for clover, timothy, etc.

Mr. James Anderson never attempted to raise mangels without salt. Low mucky soil was better for them. He used two or three hundred pounds to the acre.

Mr. Shore (Middlesex) saw the general experience was that salt acted better in a dry season. He would give them an instance of its use in a wet season. He had bought a new farm, and the insects had rendered about four acres of a field almost unfit for use. The crop of a year before had been badly injured. He sowed this field, ten acres, in barley, and on the bad four acres he used 300 lbs. of salt to the acre. He would not waste good seed on it so went to the barn and got barley tailings. The surprising result was that he had the best crop of barley on that four acre patch that there was in that section of country. He had tried salt since, but had never got such remarkable results. These stimulating fertilizers should be used on some crop that was going to be kept on the farm. It should go to enrich the farm, not to be sold off it. In the fall of 1884 he had a twenty acre field which he wished to sow in wheat and plow down with clover. For sixteen acres he had enough farmyard manure; on one acre he put no manure; on the other three he put half a ton of superphosphates and 500 lbs. of bone dust; on some parts phosphates alone, and on other parts a mixture of the two. He seeded clover and



timothy. His crop on the four acres was smaller than on the other, and he could tell the lines up the fields where the different fertilizers were used. He saw no advantage whatever in his bone dust; the barnyard manure was ahead. The year (1885) was a wet year, and the wheat as a rule lodged badly. On the sixteen acre plot he got forty-two bushels to the acre; the other averaged twenty-five bushels. The straw on the second plot was inferior; the first was comparatively bright and of good quality. The manure made the straw stiffer. The plot on which he had put special fertilizers or no manure gave a light crop of straw. Where there was no manure at all the wheat went down flat. He understood the general opinion to be that manure weakened the straw.

Mr. Lehmann thought the fertilizers furnished the experimenters ought to be analyzed, if possible. He would like to ask some of the older farmers present how they treated their manure, whether they made it under cover or outside.

Mr. Little said they made their manure in the barnyard. They did not cover it. They drew it out to the fields in winter, except for wheat. They teamed it out and left it in large heaps. They absorbed their liquid manure in the litter. They had eave-troughs on the stables and barn to carry off water. The natural rainfall fell on the manure.

Mr. Shuttleworth believed the general favor the experiments had met with would encourage others to help in them. Any who were disposed to do so would be gladly welcomed.

Mr. Lehmann asked whether the eight members who reported this year were to go on with their experiments.

Professor Brown expressed himself in favor of earnestly requesting these gentlemen to continue. The chief value of the experiments was in their being kept up steadily for a number of years.

Mr. Shuttleworth thought they should get new varieties of grain to test next spring.

Mr. Holtermann asked whether any of these soils had been analyzed.

Professors Panton and James agreed that the analysis of soil amounted to but little as a guide for basing conclusions as to manure, etc.

Mr. Hobson remarked that Mr. Blair, of Nova Scotia, who, he believed, was to have charge of the Dominion experimental station in that Province, had told him that repeated analyses of the soil of the rich lands on the Bay of Fundy which gave such heavy crops of grass, had failed to discover the necessary ingredients which would produce such a result.

Mr. Blue believed a record of rainfall, temperature and sunshine would prove of much benefit as a guide in their conclusions as to the results of the experiments. The sunshine was the same over large sections of the Province, and there were ten stations for recording it, so the results at the station nearest the experimenter would be sufficient for all practical purposes. But rainfall and temperature differed widely, and as the results of the crops depend largely on climatic conditions, these should be observed. Rain-gauges would be supplied through the meteorological office to any responsible party who would undertake to give monthly reports.

Professor Panton would second Mr. McMillan's suggestion, and which had been referred to by Mr. Blue. In observing rainfall, they should note the distribution of time in fall, whether a heavy rain for a short time or a light steady rain. There was 50 per cent. more value in a steady rain than in a heavy downpour. Regular reports of temperature and rainfall could be easily got by anyone within ten miles of any meteorological station like the one at the College. There were a lot of stations throughout the Province, but for those not so situated a rain-gauge and a thermometer could be procured. They could not hope for an instrument for registering sunshine, as they were a little expensive. They had not got one at the College yet, but he was pushing the government for one. Sunshine was of great importance, but they could estimate it very nearly by allowing ten points for a cloudy day, five points when the sky was half covered, one point when scarcely a cloud was to be seen, and so on; in a very short time they would judge quickly and accurately. In summing up, all days over six points were counted cloudy weather, all under four clear weather, those between four and six were not counted. They could compare their results with the reports of any city station in their vicinity and estimate the sunshine very closely.

Mr. Blue added that they could measure the snowfall with a stick.

Mr. Stover considered it would not be wise to undertake too much, but they should carry out the experiments and work they already have in hand. If ten experimenters were to follow up the tests of manures as in the past year, another ten could experiment with seeds, another ten in another branch, and so on. Some might have to take individual experiments. The work should be carefully and thoroughly done.

Mr. R. Rivers, Walkerton, had used salt with good results ; if it did not apparently benefit in one season, it did in the next. He used salt on six acres of his turnips, and had three acres in the same field without. The turnips with the salt gave one-third better yield than the other lot. The salt plot did not appear to be doing half as well as the other till within three weeks of when they were taken in. He followed his turnips with spring wheat, and seeded down with clover. The straw harvested was stiff, and the berry plump.

### AGRICULTURAL COLLEGES, THEIR AIMS AND ADVANTAGES.

Mr. Thomas Shaw, Editor of the Live Stock Journal, Hamilton, then read the following paper :

The usefulness of agricultural colleges will depend first, on their aims, and second on the degree in which these aims are realized. The aims of agricultural colleges may and do vary in a marked degree. Where the outlines of agriculture are taught pure and simple, and where an insight is given into its scientific side from books only, we have an instance of an agricultural college in its least complete form. These may and do lend material assistance to the farm student who is seeking for light. But a college existing for this object alone is unnecessarily expensive, as we see no good reason why it might not just as effectively do its work in affiliation with an ordinary educational college as when standing alone.

It is a question of much moment as to the amount of benefit that is to be derived from such a college. We may say that practically in this country we have not the data of experience from which to draw our deductions, and this is the ground that furnishes the best of all data. If these colleges when established, only accomplished the work of polishing the bark of the tree at the expense of its vitality, or in other words imparted a knowledge of the science of agriculture that had the effect of inclining the recipient to be less disposed to labor with his hands, generally an indication of the growth of those moss-coatings of character that are more or less fatal to progress in agriculture, then we do not want them. There is a popular impression abroad that such is the tendency of higher agricultural education, and till we correct this impression by facts that cannot be gainsaid by the production of numerous instances the opposite of this tendency, we have little hope that our farmers will ever become clamorous for a higher agricultural education for their sons in the collegiate sense of the term.

We are not sure but their are some just grounds for this opinion. Farmers' sons who have been favored with a collegiate education, too seldom return to the farm. But we fail to reflect that they never intended to when they went there. Some of them were brilliant, and they, with the concurrence of their parents, made the college but a stepping stone to help them into other professions. Another class have attended educational colleges with the intention of taking up farming as their life work—young men who had no experience whatever in the downright earnest of farming. Their experience at the most consisted of a few weeks spent in holiday visiting upon the farm of some relative, and at that season of the year when every prospect pleases. Their presence was tolerated and their so called assistance borne with, just because the farmer with all his shortcomings is of all men the most forbearing. Impressions imbibed at such a time and in such a way, give an idea of the other side of farming, about as true as that which the recruits get of the battle-field upon a gala day. These men leave college for the farm without any previous knowledge whatever of its physical hardships. It is like bringing a plant from the tropics to the Arctic circle. The work of accommodation to the new surroundings

is almost impossible. They soon leave it for more congenial work, and this but tends to intensify the prejudice against collegiate education for farming.

It is a mercy for the race, that young people cannot get true enjoyment without going through all manner of physical motions. The boy cannot get the desires nearest to his heart gratified, who stands with hands behind his back, watching the antics of his fellows on the village green. He is more impatient than the warrior of the martial post, who, on the eve of battle, is represented in his anxiety to begin the fray as standing with "foot in stirrup, hand on mane." He must with his fellows, go through the tumblings and the tossings, and he comes out of the game stronger than he went into it. But let the same boy stand on the same green ten years hence, and watch another company go through similar antics and he will find truer enjoyment in looking at them than in taking a part in the play. Indeed to do so would be positively a hardship rather than a pleasure. This provision of nature to the farmers sons is an illimitable blessing. While he is growing up he is exercised in doing light work on the farm in what not only tends to develop his muscles, but he grows up in the work of the farm as naturally as he grows in stature, so that in leaving the farm for the college with a view of coming back to it, he resumes this physical labor with no more discomfort, than he would resume an old study laid aside for a time. Note carefully the comparison we have made, for it only illustrates the tendencies of college life as it affects the physical man. When the study is laid aside for a little it is easily taken up again, when for a longer period with more difficulty, and after a period sufficiently long, it would almost be forgotten. Yet there would never be the same difficulty in resuming it as if it had never been partially mastered.

From what we have said it will be seen that we admit there is danger here, and the parent who is anxious to have his son escape it will be careful to have him kept in physical trim, by giving him more or less work on the farm during the college vacations, and the son who has a due regard to his own future on the farm, will show his wisdom by its cheerful performance.

We know we stand in danger of being arraigned as a worshipper of muscle. We repel the imputation. In farming, intellect has its place and muscle has its place, and in this above all callings we find an imperfect specimen, when one or other of these is sickly or wanting. Muscle to a farmer is of great consequence, and of even more consequence is the ability and disposition to use it. The most successful foundrymen are those who in emergency are able to build their own models; and so the most successful farmers are men who are able to show every man upon the place how to work in case of emergency. It does not follow necessarily that they must labor at all times, but it does follow that they must know how to labor, and this they can never know without having served a full apprenticeship to it at some previous period of life.

If, then, the farmer-lad can be educated in the scientific side of his future work at colleges with an agricultural professoriate, without alienating him from its future prosecution, he should have the facilities for this. The farmer can claim it as a matter of right, and not as one of favor. We have no doubt whatever but this may be accomplished with much advantage and no corresponding disadvantage, and would therefore like very much to see it tried.

Where an experimental plot is attached to the collegiate professoriate, the aim of the college is very materially widened, and the cost of the institution of necessity materially increased. In addition to imparting a knowledge of agriculture in its higher aspects the school takes up the work of discovery. Discovery has always been an expensive work. We doubt not that it has impoverished ten men for every one whom it has enriched, and yet along with the one enriched thousands have at the same time been benefited. It is therefore utterly preposterous to expect an experimental department to pay its way. In no field of experiment are definite conclusions so difficult to arrive at as in agriculture, owing to the variations of influence and conditions not under the control of man, as changes of atmosphere and the complications which flow from these. In chemistry we can fancy the same experiment conducted a hundred times with precisely the same result, as the conditions are always the same. In agriculture on no two occasions may the experiments prove exactly similar, where affected by life and growth; and hence, in these experiments, conclusions can only be drawn with the utmost caution, and as the result of



a good many repetitions in most instances. In a work so complicated it might almost seem hopeless to arrive at results at all definite, but sufficient has been accomplished in the past to encourage us to persevere.

It has been demonstrated, we do not ask by whom, that a Shorthorn bullock will lay on twice the amount of flesh per day on less feed, under three years old, than during the same period after that age, and that a time comes when there is no perceptible gain at all. It is astonishing beyond measure that the world swung through space for nearly 6,000 years without this fact having been discovered, or if discovered, in practice it was ignored. The knowledge of this fact alone is worth millions to the nations. But although this truth is almost universally accepted now, no two experiments made to ascertain the exact proportionate gains at different ages have quite agreed. Yet the needle has invariably pointed in the direction of more rapid gain the nearer we approach the birth period, and gains less rapid the farther we get away from this. So it will be with other experiments in practical agriculture, and the moment we add an experimental department to a collegiate in agriculture, we splice on the practical. Though no two of any number of experiments exactly agree, when the needle always points in one general direction, though varying a little at different times, we are after a time to accept these results as sufficiently definite to act upon them in the practice of the farm. When it is found repeatedly, that feeding rye to breeding cows has a tendency to produce abortion, though not always in the same degree, it may be accepted as the part of wisdom not to feed rye under these conditions, and so of any other repeatedly confirmed experiment.

It would not, therefore, be sufficient ground for condemning the experimental department of an agricultural college because it had failed to establish anything during a comparatively short period of existence. It is sufficient to know that it is heading in this direction. Some things in agriculture may be established sufficiently to be accepted and embodied in general practice in a much shorter time than others, but all of them relating to life and growth take time.

This, then, leads us to the rock on which many experimental stations make fatal shipwreck. They attempt too much, and, as a foregone conclusion, accomplish but little. Who ever heard of a "Jack of all Trades" that was master of one? Experiments are made with everything that comes to hand, and, as a matter of course, they are imperfectly made, and results given out to the world that are not quite correct, or that, owing to a want of sufficient repetition, are not confirmed. It requires a peculiarly constituted man to manifest the patience requisite for successfully establishing anything conclusively in agriculture proper. The world of to-day, in its blind haste, is calling impatiently for results before they have been arrived at, and too many of our experimenters are pandering to a depraved taste. It is not enough that single or even dual experiments be blazed abroad in the press of different countries, and given to the world as final, for newspapers generally adapt themselves to the tastes of their readers. There is no harm in publishing them, but until it is known that they are final, so it should generally be understood.

In agricultural experiment we would rather be instrumental in giving to the world one established truth that promised to be useful than carry a thousand different experiments that did not establish anything. The experimental department of an agricultural college, then, which does not aim at conclusive discovery is not, as we regard it, fulfilling the high mission for which it was given a being. The experimental department is more for the benefit of the country generally than for that of the students, although the latter may reap some gains. In view of this the experiments should be conducted with the utmost accuracy, otherwise their effects upon the land that sustains them may be baneful in the extreme.

We do not wish to represent that partial experiments are of no service; far from it. They may serve to stimulate inquiry, and to fasten the attention of agriculturists on what otherwise might have escaped their notice, and the issues raised may be carried on by individuals and other experimental stations, till a safe harbor is reached where the anchor of conclusiveness may be cast. But work of this nature is so foreign to the true idea of an experimental station that it should be shunned rather than courted.

When the theoretical side of farming only is taught, we have already said that we have the simplest form of an agricultural school. When we have an experimental station

added it is emerging from the chrysalis state : and, where a farm is tilled in connection with it, and stock kept, not simply as object lessons but for real utility, and where the professoriate is sufficiently ample to grapple with all the principal features of this, the grandest and most comprehensive of the sciences, we have the highest realization of an agricultural college adapted to the wants of to-day. An establishment which simply teaches agriculture in the class-room may be complete in its relation to its own particular work, and so, too, may be an experimental station, but these combined are not complete in their relation to the subject of agriculture in its entirety. A farm may be added and stock may be kept, and this makes it more complete ; but if any one of the departments of agriculture is lacking, it detracts just so much from completeness as it is relatively important. We have not then at present a fully fledged agricultural college in our Province, but the Ontario Agricultural College at Guelph is at least an approximation, as complete, it may be, as the world has yet furnished. We have the lectures in science, the experimental department, the farm, the stock, the creamery, and other departments ; but we have not all of them. Veterinary science is only taught in a crippled manner, as the infirmity is lacking, and some departments, as apiculture, are lacking in their entirety.

The objects of the farm are various. One is to assist in providing food for the stock kept ; a second, to give those not acquainted with methods of tillage opportunity of learning, whether by observing only or by taking a part, is a debatable question ; and a third, to furnish a model from which the average farmer can always carry away wholesome lessons.

Food can be raised more cheaply on a farm than it can be purchased, where the management is right, and we see no reason why it may not be on a government farm where the above requirement is forthcoming, viz., proper management. This, then, will always form a standing argument in favor of having a farm attached to such an institution. Where this department fails to pay its way, no harm should follow investigation to know the reason why. We do not think that a profit should be looked for ; if so, the margin on the right side is likely to be small, as more has to be expended in keeping the farm tidy and at all times presentable than would be necessary on any other farm.

The advisability of giving the students labor on the farm depends upon several conditions. If they try to do it right—the overseer being held responsible for this—it would seem hard to debar them ; but they should, unless experienced, do it without pay, or, at least, for a very small fee, on the principle that apprentices labor thus. Where they manifest indifference as to whether they acquire knowledge, they should be debarred from laboring altogether. But this part of the subject, we confess, is full of difficulties. The best place for recruits to learn physical farming is on the farm, and for their own sake mainly we strongly favor making a monetary distinction in the entrance fee of those who come in this way and those who do not.

We do not think it would be wise to hinder the proper tillage of a government farm for the sake of those who have had no experience in agriculture. Our prize farms in Ontario were not built up by any such hands, and a government farm should be as good as any prize farm.

We confess we have no great hopes for the success of a majority of the young men hitherto wholly unused to labor who come to a government college to learn farming, unless they have first gone through the drill on the farm. Be it far from us to give pain to or discourage anyone without good reason who is looking in the direction of the farm ; but what are the facts ?

Of the young men of this class who have graduated at the Ontario Agricultural College, how many of them, we ask, have made a success of farming ? We cannot give the figures, but the number, we are quite sure, is not large. Coming through the farm to the college, they know what they are doing. If they passed through and enjoyed this initiatory ordeal, they are quite likely to enjoy what will follow when they leave the college, and they are pretty sure to succeed.

The chances of the success of young men who leave the farm for the professions are far greater than are those of young men who leave the professions for the farm. The former, cradled in the free air of the country, toughened in their physical fibre by labor,

bring with them to their new pursuits strong brain power, which, sustained by their physical stamina, carries them well over the rough swell of life and into the harbor of success; whereas the latter, because they have not been inured to physical hardship at the right time, find the future of the farm a continual up-grade for many a long day.

A government farm should always furnish a model from which the average farmer may carry away useful lessons. Like the lady of the drawing-room, it should always be presentable. Farmers, when they come to see it, should never find stones lying about the private roads like the unburied skeletons of the battle-field; they should see no weeds that were not kept well under control; they should find no *debris* lying about the buildings or the fields in a confused way. It should indeed be a *model* farm, and the country sustaining it will be satisfied with nothing less, even though the name *Model* should be ostracised from the college nomenclature.

The right management of the farm is exceedingly important. Its bearing upon the attendance of students is such, we believe, that it will go far in itself to determine whether the students' roll shall be full or lean. When farmers visit the farm and find things at loose end, they are justified in concluding that it is not the best place to send their sons. The weakness of management in the class-room is not apparent to the average farmer, but that of the farm is, and therefore we regard it as of first importance to have the farm and all appertaining to it, as stock, etc., kept in the pink of condition.

We imagine we know well something of the difficulty of managing it thus efficiently, but the country has a right to expect it, and we believe farmers generally will be found willing cheerfully to sustain an institution kept in this condition. The farmers are justified in demanding of the Minister of Agriculture and the Government which he represents, that their Government farm shall in every respect be a model farm. Where it is not, the Minister is justified in demanding the reasons of his advisers, and they in turn of the head of the farm department, and he in turn of his subordinates. That people is a tame people, not true to themselves nor to their country who would tolerate an ill-managed agricultural college, representing as it does by far the most important industry in the land, without demanding and without trying to provide a remedy.

The aims of an agricultural college, then, in their full sense are (1) To impart to students a more perfect knowledge of the scientific side of farming; (2) To carry on experiments in the growth of plants and animals with a view to the discovery or the establishment of facts that will prove useful data on which to base practical work; (3) To so carry on the practical work of the farm in connection in all its details, that students shall have object lessons daily in the best methods of farm labor and management, and that the farmers of the country may have at all times before them a model from which they can carry away useful lessons. The effect of all this should be to elevate farming to its rightful position amongst the industries, more especially the farmer to that position of citizenship which is his natural birthright, but which he has been in the past too prone to barter for much less than a mess of pottage. It should tend to make farming more profitable and more enjoyable, and in this and other ways to ameliorate the husbandmen's too often hard lot.

We know there is a shrinking on the part of some in reference to the application of the term "model" to a farm connected with an agricultural college. This should not be, for no college thus situated will do its work properly without the farm is in every sense of the term a model one. For though the term "model" were blotted out of existence and buried ever so deep, what is implied by its present meaning would still be looked for in the management of a government farm, and justly so.

We stated at the outset that the usefulness of agricultural colleges depended on their aims, and on the degree in which these aims are realized. In defining these we have unavoidably spoken of very many advantages that must radiate from a vigorous and well conducted college; but we are far from having exhausted our theme. In addition to the direct influence of such a school it has also an influence we believe, which, though indirect, is far-reaching. It keeps the subject of better education prominently before the farmer. Though he cannot afford to send his son to the government college to which his neighbor's son has gone, he can provide him with books, and in many ways encourage him to clamber high in his profession. But the crowning advantage of a farmers' college, and



the only one we shall mention now, consists in this, that those who attend are enabled to become better farmers. If they do not, the aims of the college are either defective, or they are not realized. A young man of the right mettle attending such a school will go to work more intelligently when he goes back to the farm. He will bring to his work a fund of knowledge from which he may continually draw, while the farmer who has not had these advantages is wholly dependent on observation and previous experience. Who shall win in the race need not for a moment remain doubtful. It may be that some who have not attended such a school have distanced others who did in practical farming, but would not the gap have been greater had these been equally favored with the others?

How stands the matter with ourselves? We are quite aware that here we tread on dangerous ground. But shall we falter? No. We have an Agricultural College almost in the completest sense of the term, and no one who is at all informed will say that it does not stand well in the eyes of the agricultural world. But how does it stand with ourselves? While it has many warm friends and admirers in Ontario it is not in favor with one of the political parties, and it may be that the other is disposed in consequence to make too much of it. This is sure, that with all that it has done, and it has done a good deal, it has not gained the heart of the great bulk of our farmers, or its roll would be better filled from the ranks of their sons. This College should be filled to overflowing from the sons of our yeomen, without the enticement of any bounty, and yet it is not, and we now propose to seek the reason why.

1. There has been amongst farmers in Ontario in all time a prejudice to what is termed "book farming." Whence this prejudice arose is not far to seek. Gentlemen who had been failures at everything else, arrogantly assumed for themselves the position of teachers of the farmers, and dealt out to them in the periodicals of the day, theory seven times refined, and served it up to them along with impracticability. The farmers soon became nauseated, and the feud which thus arose has been transmitted from generation to generation. And it has been enhanced in another way. Cultured men who had seen better days, in the hour of their extremity turned farmers. As a matter of course there was much book lore in their methods, and they failed not because of this, but because of the lack of all prior experience. The College is in no way responsible for this, but it is made to suffer in consequence. We hope the day of awakening is not distant when a spirit of discernment will be given to every one of them, to enable them to distinguish between the true and the false, and to see this matter in its proper light.

2. The success of the graduates of this college will do much to remove this foolish prejudice, and the lack of this will but confirm it. Hence the great importance of having the right class of students. It is perfectly legitimate that the farmers judge of the tree by its fruits; indeed they cannot do it in any other way. If the young men of the farm who have never gone to college leave the student farmers in the race, then onlooking farmers are justified in keeping their sons at home; but if the contrary is apparent, they make a great mistake if they do no rise to the full stature of the privilege of this their birthright. If we always have students of the right class, we have no fear that they will not beat their fellows in practical farming, though their rivals in other respects should be equal. The students of any agricultural college do more for its making or unmaking than all the professors can. In the long run they will help or hurt it more by the nature of their futures than half a dozen advisory boards; they may lift it higher or sink it lower than any legislation either for the better or the worse. Consciously or unconsciously on their part the stream of the college prosperity follows them, and then it is that onlooking fathers and their sons come to test the virtues of the waters.

We do not say that students should not be encouraged to come from other lands. Nay, when exemplary young men come, able to present proper credentials, let us take them by the hand and bid them heartiest welcome. But we do say that it is more important in the future interest of the College to have the classes mainly composed of our own farmers' sons. Students from beyond the sea have carried off on several occasions the highest honors of the College, but it should not be forgotten that distinction on examination days and distinction afterwards in practical farming are very distinct things, and oftentimes are not found in the same person. If those young men excel in the latter

as well as in the former, then they are worthy of double honor, for they entered the lists at a decided disadvantage with our Canadian students, in that they lacked previous experience.

3. It is a fact that one political party in Ontario contains a number in its ranks who are hostile to the College, and also another division who look upon it with a negative sympathy. This is evidenced in the small number of the students in attendance from the ranks of this party. We speak here of the past, and we presume that so it is now. We see it also in the thunderings of one section of the press, who can see nothing good in the College; while on the other hand another section can see nothing bad; and thus it is that fair criticism is denied, which is always wholesome to any public institution. It may be that if the opposite party were not in power they would do likewise. Of that we cannot say, but this we do affirm, that it is a shame that the farmers of Ontario should allow politics either to hinder them from sustaining their own College in the highest measure of efficiency, or in availing themselves of the full measure of that long list of advantages which we have shown may flow from it. Which of the political parties can tell us how much additional it costs to sustain the animal heat in a cow exposed to inclement weather during the winter, as compared with the cost of one properly housed? Until we know this and a thousand other things relating to our calling that we do not know, we cannot afford to do without our College, nor can we in this matter afford to allow party to divide us into different camps.

Doubtless there are other hindrances to the efficient working of the College; if so, let us not shut our eyes to them, but seek to have them righted. It is a poor way to seek to have them removed by crying out "Away with the College." Why should we away with it? We cannot do without it. The day its death warrant was signed, on-looking nations would cease so far to respect us as an agricultural people; yea, we would cease to respect ourselves. In the grand march that we are making in agricultural supremacy we would be greatly hindered, and scientific agriculture which we can no more do without would sicken and die. And we cannot but conclude that from the grave of this College another would speedily spring to life within our borders in some other quarter.

Providence has blessed us with one of the most favored provinces under the sun, viewed from a standpoint of agriculture. Under Providence, we have filled it with more good stock, by far, than is to be found on any equal area in the American continent. In several lines of agricultural production we are the acknowledged leaders of the world. Farmers of Ontario, let us still further improve this favored vantage ground by so sustaining our Agricultural College, that it shall be without a peer in any country in the world.

Mr. Simons was inclined to think his friend, Mr. Shore, would like to say something. Mr. Shore was a Conservative, and Mr. Shaw had come down hard on that political party. He was sorry to hear that there had not been many of the sons of Conservative farmers at the College in the past, but he knew that the farm was gaining in favor every year. He would give the boys some advice from his own experience. Whatever they did, should be done thoroughly. They should not go out at night, without having some useful purpose in view. They must use their education; they must work hard and must put their scientific knowledge in practice. They should study agricultural literature and keep away from novels, the euchre deck and checker board. They should never bet: they had enough to do with their money without risking in that way. Education was just as good for the farmer as for anybody else. He would find fault with the location of the Experimental Farm. The farm would not produce big crops because they had not rich enough soil. The students should thoroughly understand the most suitable soil for his various crops, and the Farm has not the best soil for this. The student should not lose hold of the practical farm work. A master who could not only tell his man how to do a thing, but also show him how to do it, would gain the respect and confidence of his men. They should take their men into their confidence, tell them about their plans and their bargains, and the men would then care for the farm as if it were their own, and they had a direct personal interest in it.

Mr. Shore, though a Conservative, regretted the action of Conservatives towards the College, but he thought the more intelligent of them were beginning to see the usefulness of such an institution. He intended to send his boys there when they got big enough.

Mr. Morgan was pleased to meet again with the members of the Union. He had got valuable information from them last year, and had been much pleased with the paper, and discussions that session. The College was an institution they should all rally round as it was endeavoring, as they were, to advance the agricultural interests of the Province. He admitted that the Conservatives had censured the expenditure in connection with the college, but it had thriven in spite of their opposition, and he was thoroughly pleased that the large majority of them, with him, believed that the institution should be maintained and encouraged. To the students he would commend the wise saying of Solomon, "Whatsoever thy hand findeth to do, do it with thy might." He would urge them, both in the college and out of it, to advance themselves by every means in their power in scientific agricultural information.

Mr. Rivers contended that the attitude Conservatives had assumed in the past towards the College arose from the faults of its first management. He believed if it was carried on as it ought to be it would be a great good to the country. He was better pleased with its prospects to-day than ever before. They learn the theory of agriculture at the College, and put it into practice on the Farm. They must keep up their practical work, and should be qualified to shew, both by precept and example, to any one, the proper method of doing any matter of farm work. Their outside work must not be neglected if they were to succeed.

Col. Campbell thought the Union a fine institution. He would not advise them to go too heavy into the experimenting at first. In the hurry of business in the spring, it was a little hard to get time for careful experiment. Two or three acres would require considerable observation and noting down, but what they could speak of confidently they could report to the Union. They had found out that salt was beneficial on their land by using in detail and noting results. As to the College, he thought a visit to it would dispel the prejudices of any farmer. Two of his neighbors, among the best farmers in Halton, Messrs. Fothergill and Blanshard, though living so near it, had never visited it till 1885, and now they think, with him, that it is one of the best institutions in the country. The difficulty with Conservatives was that they based their opinion of the College on the statements of the *Mail*; but he was glad to see that now it was independent, the *Mail* used the College far better.

#### APICULTURE, ITS RELATION TO AGRICULTURE AND ITS DEVELOPMENT.

Mr. R. F. Holtermann, of Brantford, read the following paper:

A great deal of attention has been directed by the general press of our country and England during the past season to apiculture. The reasons for this are various, but chiefly owing to the display of comb and extracted honey made at the Colonial and Indian Exhibition by the Ontario Bee-keepers' Association. This exhibit was the largest display of honey ever made in any country and was organized by bee-keepers of Ontario. The freight expenses were paid by the Dominion Government, the Ontario Government granted \$1,000 to assist in defraying further expenses, and those sending honey met the balance of expenditure by paying a tax of so much per lb. upon the respective quantities sent. Messrs. S. T. Pettit, S. Corneil, J. B. Hall, R. McKnight and D. A. Jones were the commissioners selected to attend the exhibition. Mr. Hall finally found it impossible to attend, leaving the four. These commissioners succeeded in selling all the honey put in their charge at a satisfactory price, being about 10 cents per lb. net. for extracted. They also succeeded in placing their honey in the hands of the very highest classes in England, and our commissioners returned with the honest conviction that our Canadian honey has no equal in the world; that is, honey cannot be produced in any



quantities to compete with Canadian honey in the markets of the world. We now only require to have a constant supply and of the best quality to retain and increase the foothold we have in the market.

The price is not likely to increase, in fact  $7\frac{1}{2}$  to 8 cents per lb. net is all we can expect. When we remember the time when honey was 25 cents, the uninitiated may marvel and wonder how we still make it worth while to produce honey. The solution to the problem is: we have learned how to produce more honey and at a less expense. This still continues to be the problem; and step by step the moveable frame hive, the honey extractor, the comb foundation, and many minor inventions, with discoveries as to the best use to be made of them, all these have and are assisting to enable us to produce honey for less than heretofore. True, we have had reverses, but, all in all, progress has been rapid and sweeping. This progress may attribute to the fact that as a class, bee-keepers read more than perhaps any others who labor with their hands; they are communicative and fairly enthusiastic; all exercise means progress. This progress is all the more creditable when we remember that if we except an experimental station established for the advancement of bee-keeping by the American Government and apicultural departments in two or three of their agricultural colleges, and some steps taken by the German and Australian Governments to promote bee-keeping, all of recent date, this progress is due to the efforts, and unaided efforts, of the bee-keepers themselves.

One of the troubles of the present day is an extreme we have allowed ourselves to drift into, and it is over manipulation. The old box hive or straw skep had the swarm shaken into it when planted, and when the honey harvest came the swarm was smothered. From this, by means of the moveable frame hive, we have got into fussing and fixing in season and out of season with our bees and over manipulation, losing time and retarding their work; and now this is being done by the wholesale, namely, whole hives are being reversed and inverted. If not done carefully, and by one understanding the condition of the brood and surplus chamber, and the effect of reversing and inverting, this system may prove an even greater pest than the manipulations of individual frames.

Let it be understood I do not here condemn the judicious use of these modern hives; far from it. Some of them may be a great advantage, but I reiterate, we must be very careful in the use of such hives, and a novice may ruin his apiary. Our most successful Canadian bee-keepers are getting back to disturbing the brood of their colony but little, contracting it not at all during winter and spring unless in exceptional cases, and the sooner we all learn this and how to work them successfully on this principle the better, the less danger will there be of this much dreaded foul brood. It will be both a preventative, and where existing, be of some assistance, or, at least, we will not aid in spreading the disease.

And then, as to its relation, it is a beautiful study to find how the honey bee is an instrument in assisting the fruit grower, the clover seed producer and all those whose crops depend upon the fertilization in the largest quantity possible the flowers which eventually produce their crop. The honey bee cannot rifle the flower of its store of nectar without passing the centre of the flower which contains the pollen, which latter requires to be distributed to the stigma. When the nectar is secreted by the flowers the anther which contains the pollen is bursting and showers from it the pollen; and the stigma will have a rough moist surface, or in short be in the most favorable condition to enable some of the pollen to attach itself to the stigma. But these conditions are not always favorable. Often days pass and much opportunity is given, and our fruit crop is proportionately large. But we know during the spring of the year how uncertain our atmospheric conditions are, and a drenching rain or such like may have given but little opportunity for fertilization, and we find with regret our fruit crop is but scant. Then again, the core of an apple is divided into segments and each segment has to be individually fertilized. Failure in part of this results in a part of the apple being dwarfed, or wind-falls, a result we have frequently seen without knowing the cause. But the flower being in a proper condition for fertilization, the nectar is being secreted and the Creator of all things in His infinite wisdom has provided for us an agent which is attracted by the fragrance of this flower. Who has not seen the busy bee amongst the parts of a flower, and who can doubt after seeing it covered with pollen—acting as a transmitter of the pollen from anther to stigma

—who can then fail to see the beneficial results secured in this way by means of bees? Of late some attention has been paid to injuries done by bees to fruit. Convincing experiments by means of placing fruit of all kinds with bees in all stages of starvation show that the mandibles of bees are powerless to puncture fruit; but if the covering of the fruit is damaged ever so slightly they will readily avail themselves of this opening to extract the juice. Such action, however, cannot be considered ground for prohibiting bee keeping.

In conclusion, I would say, honey permitted to be well ripened by the bees has few equals as a food, especially for the young. It is a sweet which has already undergone the first stages of digestion by the bee, and is almost ready for assimilation by the system. It has medical properties from the formic acid, which it receives from the bee, and properties transmitted to it from the plant the flower of which has secreted the nectar. Honey should not be eaten in large quantities. Many when first eating honey are inclined to take it in immoderate quantities, and the results are injurious and sometimes create a repugnance for this sweet, temporary or lasting. When a family has become accustomed to honey, there is no danger of this. Therefore, bee-keepers, do not attempt to sell a novice too much honey at the start. Properly treated he may become a lasting customer to your own and his benefit. If he tires of honey, and knows not the reason, he may become a bad advertisement. Again, I would say do not over-manipulate your apiary. Judicious treatment of a weak colony is beneficial no doubt, but better than to overdo it with an entire apiary, is to let them all alone.

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#### QUESTION DRAWER.

The "Question Drawer" was again re-opened, and the following discussion was elicited:

Does Lucerne mature its seed properly in this province, and is it harvested similar to other clovers?

Prof. Panton said Lucerne was introduced into the province in 1876. So far as he had heard it matured its seed well, but he would advise the getting of new seed for sowing. It was threshed like alsike.

. What is the most economical way of building or re-building a barn suitable for a 200 acre farm? What is the best way of arranging the stables, and also the main part of the barn.

Mr. Biggerman had purchased a farm with an old barn on it, and he was debating whether to pull the whole thing down or try to refit it.

Mr. Hobson said that it was very hard to advise in such a case. A commission of fifteen members of Parliament, two or three farm experts and a famous architect had spent two days, and a part of the commission had spent two or three days more, in discussing, examining and deciding on the plans for the new College barn, and many would doubtless say that they had botched it after all. To reply to Mr. Biggerman's question, one would need to know the value of timber, the convenience of stone, labor, etc. The problem could be best wrought out by the owner to suit his special requirements. He should spend a little time and money and carefully inspect the most improved barns in his neighborhood of similar capacity to the one needed.

Mr. Stover and Mr. Hobson agreed in advising against the use of the old frame, for if the old building was not of the exact size it would make an unsatisfactory job. It would be far better to pull the old barn right down to the bottom and use the good timber in a new barn.

What are the best scales for weighing milk? Reference being made to keeping milk records.

Mr. Lynch, of Quebec, who had asked the question, was strongly of opinion that spring scales were far preferable to any other, but there was a law against their use. He had found spring scales in use, however, in some good creameries, and even in the govern-



ment post offices. They were used there because more convenient. The law prohibits their use because they are not sufficiently correct for ordinary commercial transactions, but why should the farmer be forbidden to use them? He would ask the support of the Union in an effort to have the law changed on this matter. In keeping a milk record one day in seven accurately taken was sufficient for an average record. If the farmers are to keep the actual weight of the milk they must have an easy means of weighing it. Why should they be debarred from using them? The argument against spring scales in commercial transactions would not apply to the farmers' requirements.

Mr. Macdonald said by their system they used no scales, and it was in use at the Experimental Farm creamery. They took the pail and marked it for every three or four pounds. They worked on a water basis and marked in accordance with the specific gravity of the milk.

Mr. Lynch—What about the froth?

Mr. Macdonald—We strain the milk.

Mr. Lynch—Do you strain each pail separately?

Mr. Macdonald—We use a milk pail with strainer attached, such as can be procured anywhere.

Mr. Little said they had a weighing pail on an ordinary platform scales, into which they poured their milk and then weighed it.

What is the best date to sow turnip seed?

Mr. Hobson believed in sowing turnips from the 15th to 20th June. They thus avoided the fly and promoted rapid growth.

Mr. Laidlaw's experience was also to the effect that from the 15th to the 20th of June was the best time. He used to sow about the 8th or 10th, but found better results from sowing a week or so later.

Mr. Chrysler sowed between the 5th and 20th June. Long necks he ascribed to being left a little too long before thinning. The turnips should be thinned before the leaves were fully developed. He got good turnips from sowing as early as the 5th; they were inclined to be smaller if sown as late as the 20th.

Mr. Hunter considered this a very important question, more especially to stock-breeders, as turnips were their staple winter food. He agreed with the preceding speakers as to time. They should carefully prepare the soil and treat the plants thoroughly. He used a top-dressing consisting of 150 pounds of salt, a barrel of wood ashes, and 100 pounds of plaster to the acre. He would specially urge the students to make a specialty of some branch of agriculture, either stock-raising, dairying, or some other line. Doctors, merchants, and other men in connection with their regular work, made a special study of some one thing, and farmers should do the same.

How would you know a Down sheep from other breeds if it were not for the color of face and legs? Shall we breed long, short, or medium woolled sheep, and what breed or cross, considering the present state of the market, for wool and mutton?

Prof. Brown said it was rather difficult to tell; Downs had the finer wool, however.

Mr. Whitelaw believed that on good soils, with good management and good food, the Leicesters would take the lead. The Southdown, though, is a very fine sheep. The Leicester is keeping its ground well in Scotland; from \$200 to \$600 are paid for Border Leicester rams there. We were told a few years ago that the Shropshire was the coming sheep. The wool was nearly as fine as the Southdown, and the meat nearly as good as the Leicester. A nice Border Leicester ewe should weigh about 330 to 340 pounds, and would bring \$100 to \$150 in Scotland. There was a lack of uniformity in the issue of Shropshire ewes. A big U. S. sheep breeder had spent a year and a-half in England and Scotland, inspecting the different breeds of sheep, and he had come to the conclusion from his observations that the Shrops and Oxford Downs lack prepotency. He had imported ten Leicester ewes two or three years ago, and his lambs had always come regularly.

Mr. Simmons was of opinion that it would depend largely on the individual taste of the breeder as to which kind of sheep he would raise. In his earlier years he had taken

many car-loads of sheep to New York market, and he knew that he got three-fourths of a cent more per pound for a black-faced cross than for a white face. The Leicesters were nothing but a lump of fat: the Southdown had far better flesh for eating.

Mr. Whitelaw explained that the Leicesters were not bred in Scotland for mutton, but for breeding purposes. The Leicesters gave an excellent cross for substance and size.

Mr. Chrysler did not deal much in sheep, but had heard that three Southdowns could be kept to two Leicester or Cotswolds. If this were so, the Southdowns would pay the farmer best.

Mr. Anderson knew a cent to two cents more per pound could be got for a black-faced cross than a white-face cross. He found out by experience that the Southdowns were the best sheep for him to keep.

What effect would it have, would it be advisable, and what kind of horse would it produce as to endurance, hardiness, strength and style, to breed our common mares and half-bred Clyde mares to English coach horses?

Mr. McMillan was of opinion that the English coach horse and our common mares produced good horses, but that the English coach horse and a half-bred Clyde mare would not give good results.

Mr. Watson did not think it advisable to mix a cross of one breed with another breed. Crossing a thoroughbred or coach horse with a common mare would be all right, but with a half-bred Clyde it would not be good. We could get nice carriage horses from plump, wide-set mares and the thoroughbred horse. He thought the coach horse a good one.

Mr. Hunter believed that what was commonly called the coach horse had not its character sufficiently established to cross with our mares. The Cleveland bay horse would bring as high a price. The difference between the English coach horse and the Cleveland bay was that the former had not been bred for a sufficient length of time with the same object in view. What the English coach horse was designed to produce was a hard, wiry horse that would go at a rapid rate for ten miles. When coaching went out, these horses were crossed with heavy mares to produce agricultural horses.

Mr. Grenside said that Mr. Hunter had got as near unravelling the question as to the difference between these horses as any one he had heard. For himself he did not believe there was any material difference between the two. There was not much prepotency in either. He considered them local breeds of the same horse. He agreed with Mr. Watson that crossing a moderate mare with a thoroughbred horse would best meet the present demand. At this time there was a great call for a good light horse, and there was no manner of improving our present stock save by the introduction of thoroughbred blood. All the good stock they had in the country came from the thoroughbred horse. The light stock of Great Britain was held in high repute all over the world, and the reason of it was that they keep their thoroughbred stock pure. The farmers of this country could raise the standard of their horses and render them saleable by a more general use of the thoroughbred horse. He would recommend an 1,100 or 1,200 pound horse of good muscular action, attention being paid to symmetry, temper, quality and soundness. A horse predisposed to temper should be guarded against. The British authorities had issued a fresh commission this year and were extending their purchases of horses, and it would be to the interest of the farmers were they to breed to satisfy the requirements of this trade.

Mr. Stover asked whether large mares should have a large horse or a smaller one.

Mr. Grenside said the thoroughbred had been brought into bad repute by being bred to too small mares. A mare of 1,200 or 1,300 pounds should be bred to the thoroughbred horse. The latter is as much a distinct breed as the Clyde.

Mr. Stover had found the best mares of the country partially bred. What he more especially wanted to know was whether if you had a big mare you should get a small horse, or one of about the same size.

Mr. Grenside replied that that would depend largely on what they were breeding for. The disparity between the two should not be too great; they should grade gradually. A horse of from 1,200 to 1,300 would suit an ordinary agricultural mare. For heavy

horses they might first cross with a Suffolk or Percheron and then with the Clyde or English cart horse. In response to another question, he said that proper management was a great factor in the training of horses. A horse's manner could be moulded by being bred from good horses.

Mr. McMillan said that the horse that was wanted in England was a horse of 1,200 or 1,300 pounds, of good appearance. Over there they did not care so much for speed in a carriage horse, but liked him to lift high.

Mr. Grenside believed the lifting high, or the knee action, was difficult to get. He had notice that the common Canadian horses bent their knees well and this made them look showy. The thoroughbred was deficient in this point, but the mares could counteract this fault and supply the need. He was not in favor of breeding too much to the trotting horse. As a rule such horses had not a good appearance.

Mr. Campbell thought there were only two classes of horses needed in this country, the heavy horse and the blood horse. He did not believe in breeding from the coach horse and a mongrel. They could get a good carriage horse by crossing their common mares with a thoroughbred.

Mr. Watson was largely in sympathy with the preceding speaker. There were too many horses kept for breeding purposes in Canada. Farmers did not know what kind of horses they wanted. They should find out and then breed accordingly. The general purpose horse was not a profitable one. The handiest horse on the farm was one from 1,200 to 1,300 pounds weight. They wanted, too, more bone and size in the thoroughbred, as the purer bred parent stamps his qualities quicker on the offspring in development.

Mr. Grenside had found that there was considerable doubt as to what a thoroughbred really was. In some quarters the Clear Grits and Hambletonians were considered and called pure-bred horses. The thoroughbred evidently was not known there.

#### CLOSING EXERCISES.

The proceedings were then brought to a close by congratulatory addresses from President Mills and Mr. Simons, Middlesex, speeches from the newly elected officers and three hearty cheers for the visitors, among whom was Messrs. McMillan (Huron), Morgan (Middlesex), Heacock, Rea, Macdonald, Farmers' Advocate (London), Simons, Shore, Anderson, Whitelaw, Hobson, Laidlaw, Jas. Taylor, Havers, Davis, Freeman, Biggerman, Harcourt (Lincoln), Fisher, Gilchrist, Rudell, Rivers (Bruce), Campbell (Halton), Lynch (Quebec), Danville, Little (Huron), and a number of others. The gathering throughout was very successful, instructive and harmonious, and shows increasing vigor and usefulness.

The President, after a few appropriate remarks, brought the meeting to a close at 5.30 p.m.



# FORESTRY REPORT.

1886.

COMPILED AT THE INSTANCE OF THE GOVERNMENT OF ONTARIO.

BY

R. W. PHIPPS,

TORONTO.



Toronto :

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1888.





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DESCRIPTION OF CONTENTS.

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To the Hon. A. M. Ross,

*Treasurer and Commissioner of Agriculture.*

SIR,—I have the honor to forward my Report on Forestry for the year 1886, which has been delayed rather later than usual, to include certain valuable information obtained last month from the American Forestry Congress and U. S. official sources.

It will be found to contain :—

1. A statement of the amount of firewood yet standing in older settled Ontario, being based on reports from 160 townships.
2. Descriptions of Forestry examinations of two townships—one north and one south—with opinions of most farmers resident therein, and details of observation as to effect of clearing, influence of woods on crops, and value of trees as wind-breaks or otherwise.
3. Correspondence and observations with reference to the pine forests of Ontario, giving descriptions of present method of management, and suggestions of possible improvement.
4. Information as to the progress of Forestry in other countries, with valuable information given at the late Congress in Illinois.
5. Articles on various points of Forestry affecting Ontario, both original and selected, with details of new plantations here, and experiments made.
6. Work done during the year, and recommendations as to further steps desirable to be taken in the interest of Forestry, both in the farming and lumbering districts of Ontario.

Respectfully,

R. W. PHIPPS.



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## INTRODUCTION.

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The fertility of Ontario is greatly affected, as is that of the States of the Union, of late years, by the artificial changes occasioned through settlement here and elsewhere. Fifty years since the sun rose on a different America. The great prairie country was an interminable sea of waving grass, the Northern States largely a forest. All this is now altered. The forests to the south are diminished to comparative nothingness ; and a great expanse to the south, the west, and the north-west—large enough to make half a dozen European kingdoms—has been turned with the plough, and the ponds, streams, and sloughs largely drained. Our own Ontario, then a forest, may, in its more cultivable portions, be considered as cleared. In consequence the winds, from many points, which formerly blew over forest and grass, all of which gave off continual masses of moisture to the atmosphere, now pass over a soil much drier, even heated, which, instead of giving moisture to the passing breeze, absorbs that which it contains. The result is that those breezes, which formerly gave us continuous summer showers, do so no longer. The rainfall is, perhaps, still in equal volume in Ontario, but not equally well distributed, and our forests to the north obtain a moisture which at an earlier day fell closer to the lakes. The result is well known—our harvests are diminished, and our prosperity decreased.

For this there is but one remedy—more general tree-planting here. And here, in this introduction, I would like to suggest to those who are most likely to afford the work the assistance and example it needs—those, I mean, of our farmers who are sufficiently well-to-do to spare the time and cost—that if they will plant each a few acres of trees it will not only beautify and enrich their own farms, but will induce many others to follow in their steps. Many such, I am glad to say, are moving in this direction ; but thousands more are needed. Let me add here an idea well stated of late, “The way to encourage the planting of trees is to plant them.”

In the following pages many facts bearing on these important matters are stated, and the experience of many well-informed individuals given. If those who receive the book will, at their leisure, carefully read these statements, there is every hope that valuable action will be excited. Excellent results have already followed the distribution of this forestry literature both here and elsewhere ; but very much remains to be done before re-planting can to any extent counteract the evils occasioned by the over-clearing hitherto practised throughout all North America where settlement has occurred.





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## FORESTRY REPORT, 1886.

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### CHAPTER I.

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#### SUPPLY OF WOOD FOR FUEL IN ONTARIO.

To those who remember the splendid forests of Ontario as they stood in a former day, the apparently interminable supply of bright beech and solid maple, it seems little less than sacrilege to admit the idea that our farmers would ever choose to clear their farms to the uttermost acre, and rely on coal for warming their habitations. There is surely an enchanting remembrance of the wood fire. We think of the road-side tavern, its hearth fronting the blaze of a pile of four foot cordwood; of the evening parlour, and the hickory logs a mass of white hot coals, the cooking of pop corn and the roasting of nuts, prophetic at Halloweve of many a matrimonial future—the bright clear blaze where hemlock snapped and crackled in the early morning, when shivering we came from the upstairs rooms, then ignorant of fire, and all the more healthy therefor—ten thousand pleasant memories throng around the old wood fire. It is much more clean, it is fifty times more healthy than that produced by any coal that ever Lehigh sent. When the passer by looks at a farm, he thinks, “Where is its wood lot—its grove of fuel-providing trees?” If he sees none, and is of my mind, he will say, “What, he has cut down all, and perhaps depends on coal. Pass on; we do not wish to visit him; let a wood fire crackle its welcome to me.”

There is a great portion of Ontario which, if its own reserves of firewood were exhausted, would be too far from the back country to draw its supply thence. That is to say, when these reserves no longer afford a supply, it will be cheaper to buy coal than to pay for the carriage of firewood to this part of the country. How decidedly this will be the case, will be at once understood when it is shown that in townships where railway facilities are plenty, it is now cheaper, in many instances, to buy coal than to purchase wood, although the latter can be cut close at hand, or bought at a low rate. The townships so situated would be in number probably somewhat less than two hundred, which would cover all the most important and older settled portion of Ontario. I have either personally examined, or have had information through the most reliable source, the Township Clerk, from the large majority of these, and following will be found a summary from

about 160 of them, the object being to ascertain how long a supply of firewood will be obtainable within their borders. From this may be obtained an idea of the fuel now existing therein, and its probable duration. It will be observed that many state that with care a certain duration may be expected; and others allow for the increase, and growth of the younger wood. As has been often proved by experience, of which I have published many instances, if a portion of forest in good condition—where not shallow-rooted or especially exposed to being blown down—have cattle excluded from it, the undergrowth will preserve the bush in a perpetual state of vigor, and young trees will be ready to take the place of the old. Such a forest can yearly be drawn upon for firewood in considerable quantities, without injury to the bush resulting. But this is the case in no great proportions of our woods; cattle are too often allowed full range; and the opinions expressed, as to the supply of firewood here given, are based on this too general state of affairs, and the likelihood of forest survival under it:—

## BRUCE.

Saugeen.—6,572 acres; no coal used; hard times would increase wood-cutting.

Brant.—17,370 acres bush.

Eastnor.—Half bush.

Greenock.—8,267 acres bush, 9,187 swamp, mostly timbered; wood largely shipped out of township; no coal used.

Amabel.—Supply sufficient for thirty years; no coal used.

Bruce.—One-sixth yet in bush; no coal used; standing timber rapidly blowing down.

Carrick.—18,033 acres yet in bush, about 22½ acres for each family, including those in villages; little coal used; forty years' supply.

Lindsay.—Twenty years' supply; no coal used.

Arran.—14,000 acres wood; calculation, 700 dwellings, using about 12,000 cords 4-ft. wood per year; little coal.

Elderslie.—14,212 acres wood: coal not used; large quantities sold to villages and R.R. stations yearly, still supply for a long time, if properly managed.

Huron.—Little coal used; all timber nearly exhausted; township drawing firewood from adjoining townships.

Kinloss.—Supply about twenty to twenty-five years; probably 5,000 acres good bush.

Culross.—Some coal used in villages; 6,805 acres of wood, besides swamp.

## BRANT.

South Dumfries.—8,048 acres of wood: number of families, 796: allowing one-fifth of woodland to be used for farm purposes, leaves 6,438 acres for firewood; suppose each acre will turn off twenty-five cords of wood (the woods on farms being nearly all culled) will make 160,950 cords of wood, and if each family consumes ten cords per annum, will give a little over twenty years' supply. I think the above calculation is not far from the actual state of the matter, the woods having been thinned out very much for timber for farm use, and also the best timber has been sold to the mills, to be made into lumber, so that the woodland will not yield more than one-third of what it would in its primeval state. Coal is largely used through the township, perhaps one-half of the population using coal for at least half of their fuel; of course this is only an approximation, but I do not think it is far from the truth. It is a great pity that our farmers do not plant trees, many parts of their farms being only adapted for that, and not arable, especially along creeks with steep banks. They complain that their fathers cut down all the woods; but they do not move an inch to mend the matter.

Onondaga.—Little coal used ; no uncleared farms ; some farmers are preserving their wood, some few have none ; on the whole, twenty years' supply.

Burford.—Fifty years' supply, if coal were not used ; considerable, however, is used both in the villages and on farms.

#### DUFFERIN.

Mulmur.—Little coal used ; 10,000 acres wood ; should supply present population thirty or forty years.

Mono.—By assessment roll, 11,520 acres wood ; but do not think this is correct, as the assessors estimate the cleared land, and set down the balance as wood and swamp ; probably no scarcity for twenty years : little coal used ; a few have coal stoves for parlors, etc.

East Garafraxa.—On an average, one-tenth is wood ; coal little used.

East Luther.—Assessed at 8,677 acres wood and swamp ; marsh and waste land, 12,864 acres ; probably twenty-five or thirty years' supply ; some coal used.

Melancthon.—No coal used ; twenty-five years' wood.

#### DURHAM.

Cartwright.—6,731 acres wood ; coal little used : wood getting very scarce ; hardwood in this remote section, \$3 to \$4 per cord.

Darlington.—9,733 acres uncleared ; but it must be understood that much of this, so returned, is run over, and is but a good pasture for cattle ; coal is used as wood decreases of wood, about ten years' supply remains.

Clarke.—About ten years' supply ; a quantity of coal is used.

#### ELGIN.

Aldborough.—Assessed woodland, 33,226 acres ; and 36,342 cleared. These quantities are deceptive, woodland being ascertained by deducting the supposed quantity of tilled land from the total owned by each person assessed. For instance, a lot, 200 acres, has, say fifty acres under crop, and fifteen acres in old fallow, choked up with young second-growth, which will be cleared up as opportunity affords, but at present it ranks as woodland, although worthless, and not intended for future preservation. Would rather not make calculation ; very little coal used.

South Dorchester.—Little coal used ; would think there is wood for seventy-five years.

Dunwich.—Nearly every farm of 100 acres has a fine reservation of twenty or thirty acres : no coal used ; the wood will last many years.

#### GREY.

Sarawak.—Coal not used ; 1,000 acres of bush.

Glenelg.—Little coal burnt ; 14,000 acres of bush, calculated to last present population eighty-four years.

Normanby.—From sixteen to twenty acres are yet standing on farms of 100 acres, on an average. There are 10,315 acres of wood which, if properly managed, is expected to last for generations.

Proton.—24,000 acres of wood ; the stock of firewood, therefore, will take long to exhaust : the rapid disappearance of the forest, however, is injuring our climate. I think our public schools might wisely turn some attention to arboriculture.

Bentinck.—No coal used ; 23,543 acres of wood.

St. Vincent.—Could not estimate ; think one-fourth of the township yet in bush.

Keppel.—No coal used : at the present rate all our soft wood will be gone in four or five years for saw-logs ; but the township has so much stony land covered with maple, that its supply of firewood seems inexhaustible.

Artemesia.—28,000 acres of wood, enough, therefore, for a great number of years.

Egremont.—Farms will probably average fifteen acres of wood, enough, perhaps, for thirty years ; coal is not used on the farms, but is in all the principal stores of the town.

Derby.—16,451 acres of wood ; being near Owen Sound, much of this will be consumed there ; coal not used.

Collingwood.—The exact length of time the bush would last is a difficult problem to solve, as there is a great amount of bush land held for the timber to be used in different ways ; I should judge about 15,000 acres in the township. The assessment roll never gives the proper answer to the question, "How much cleared land?"

Sullivan.—No coal used ; probably twenty-five years' wood standing.

Osprey.—Three-sevenths yet wood ; many years' supply ; no coal used.

#### HALDIMAND.

North Cayuga.—The calculation asked is difficult ; probably one-eighth yet in bush.

Dunn.—No coal used ; each 100 acres has about thirty acres of wood left ; enough, if preserved, for forty years or over.

Seneca.—Coal little used ; fifteen or twenty years' wood.

Canborough.—About fifteen years' wood ; little coal used. If no more care be taken of the forest, in about twenty years it will be a prairie in this township.

Moulton.—Our woods might last for fifty years, but there is as much sold each year as is consumed in the township ; and a great portion is liable, as heretofore, to be killed by fire.

Oneida.—No coal used yet ; the wood supply will not, with the utmost economy, last more than twenty-five years.

Rainham.—No coal used ; over 5,000 acres of wood standing.

Sherbrooke.—No coal used ; wood for twenty-five years.

Walpole.—Little coal used, except in the villages, where one-half use coal ; not more than eighteen or twenty years' supply of wood.

#### HALTON.

Goderich.—About 11 acres of wood to each eighty-acre lot ; coal is not much used yet, but must be shortly.

Trafalgar.—The consumption of coal will soon be general ; perhaps eleven years' supply of wood.

Nassagaweya.—8,500 acres of hardwood ; allowing forty-three cords to the acre, would give fifty years' consumption.

Esquensing.—Coal is used in the villages : the townships have probably twenty-five years' supply of firewood.

#### HURON.

Stanley.—Coal little used ; 7,932 acres of bush land, and 432 farms of 100 acres each, on the roll ; allowing each acre of bush to supply fuel for a farm for four years, this would give seventy-three years' fuel.

McKillop.—Our township, containing 52,000 acres, will scarcely average about five acres of bush per hundred acres ; there are a good many farms all cleared, and no bush ; some of my neighbors say that three acres per 100 is a nearer approximation than five ; there is no coal used, except in the villages, coal being cheap.

Hay.—No coal used for domestic purposes ; possibly thirty years' supply of wood standing.

Ashfield.—3,000 acres bush ; coal rarely used.

Steven.—Possibly twenty years' consumption.

Wawanosh West.—Supply for many years, the wood area being large.

Grey.—Fifteen years' consumption ; little coal used.

#### LEEDS.

Elgin.—Farmers have been very careful of their timber here ; with care there is fifty years' consumption.

North Crosby.—Ten years' supply ; coal much used.

Kitley.—Wood for sixty years.



Front of Leeds and Lansdowne.—Twenty years' supply ; a good deal of coal used.  
 Rear of Leeds and Lansdowne.—Many years' timber.  
 Rear of Yonge and Escott.—Many years' timber ; wood area large.  
 Front of Escott.—Little coal used : twenty years' wood.

## LINCOLN.

Clinton.—Could not calculate ; 3,895 acres assessed, but if all the timber was put on one-third of the land, it would not make a very thick bush.  
 South Grimsby.—Some coal used ; acres of woodland, 3,556.  
 Grantham.—Acres of woodland, 1,159 : one-half burn coal.  
 North Grimsby.—4,000 acres of woodland ; some coal used.  
 Caistor.—Little coal used ; perhaps thirty years' wood.  
 Louth.—2,145 acres of woodland : some coal used.

## MIDDLESEX.

Adelaide.—About 11,000 acres, each of which would give thirty cords of wood.  
 Nissouri West.—With some parties the wood is nearly exhausted, but as a general thing there is enough to last fifteen or twenty years ; coal is used by some, but people are finding out that it is too expensive. The bush is now preserved as much as possible, and in some instances tree planting is being commenced.  
 West Williams.—Assessment returns cannot be depended on. I know many instances where the farmer returned 100 acres of wood, while there are only forty or forty-five. More care is being taken to preserve woods : probably twenty-five years' consumption here.

Mosa.—Twenty-five or thirty years' consumption.

North Dorchester.—Our township woods are being taken good care of.

Westminster.—Twenty years' consumption ; coal is frequently used.

Metcalf.—Twenty years' consumption ; no coal used.

Delaware.—Eighteen years' consumption.

Ekfrid.—There is hardly any land cleared, except what is cleared by taking wood off, so, in my opinion, it will take at least forty years to use up all the woodland ; and taking into consideration that a good deal of coal may hereafter be used (although little is used now) we may assume that it will take sixty years before all the wood is consumed, and then there may be some left ; no doubt there will.

Caradoc.—About twenty-five or thirty years' supply.

Williams East.—Perhaps twenty-five years' consumption.

## NORFOLK.

Middleton.—No coal used ; fifty years' supply.

Woodhouse.—Calculation difficult, as on a good deal of the land returned by the assessor as uncleared, there is no wood on at all ; it has been taken off, and the land is ready to be broken up when the stumps are rotted out.

Townsend.—Very little coal used ; thirty years' supply of wood.

Houghton Centre.—No coal used ; there would be many years' supply of wood, but we export it at three points by lake, also, our maple is being used for lumber.

Charlotteville.—Reported uncleared, 26,000 acres, but the greatest part thin, the timber having been nearly all taken ; perhaps over twenty-five years' supply.

Walsingham Centre.—Wood, I think, in ten years will be very scarce : and in twenty, not to be had.

## NORTHUMBERLAND.

Cramahe.—One-eighth use coal ; fifteen years' supply of wood.

Percy.—With care, there should be thirty years' supply.

Alnwick.—About thirty years' supply.

Hamilton.—Much coal used in winter ; wood for eight to ten years.

Seymour.—Little coal used ; 1,900 acres wood.



## ONTARIO.

Pickering.—Coal used very extensively; of the township, not one-half is uncleared; about ten years' supply.

Brock.—Probably fifteen years' supply.

Seugog.—Little coal used; probably fifteen years' supply.

Uxbridge.—Over twenty years' supply; little coal used.

Whitby.—Quite an amount of coal used; ten years' supply of wood.

Rama.—I think, in thirteen years from now, firewood will be pretty scarce; quite a number of farms have not enough for five years' supply, and are getting wood where they can. A large portion of the uncleared land is a burnt rock, and burnt over twice at that. The mills are manufacturing all kinds of hard and soft wood; and as is generally the case, people who have marketable stuff are disposing of it as fast as they can take it out. The coal that is burnt in the township is not worth mentioning.

Scott.—Some coal used: twenty-five years' wood.

East Whitby.—Six or seven years' supply; coal is much used.

Mara.—Over half the township uncleared.

Thorah.—Township nine-tenths cleared; probably twenty years' supply of timber; but this will be much lessened by the fact of fire having run through the woods, so that much timber will rot or be otherwise destroyed.

## OXFORD.

East Zorra.—Nine-tenths cleared: many have no wood; coal will shortly be used altogether.

South Norwich.—Supply for ten to fifteen years; coal little used.

East Nissouri.—One-ninth woodland; no coal used; perhaps fifteen to twenty years' consumption.

Blenheim.—Much coal used.

## PEEL.

Mornington.—Little coal used; average bush, twenty acres to 100; if taken care of and cattle kept out of bush, would last many years, as young timber would be growing.

NOTE.—With such care, many woods would last for ever, but it is rare.

Albion.—Supply of wood, over fifteen years; use of coal increasing.

Caledon.—Some say ten years, others fifteen, with the care now exercised; much coal is used, owing to three railroads running through the township.

Toronto Gore.—Sufficient timber to last for fuel for twelve years: about a third of the farmers have no bush; very little coal used; considerable coal and wood coming in on cars; farmers not saving bush as they did some time ago.

Toronto.—Much coal used; ten or twelve years supply of wood. Quite a number of my neighbors are buying firewood at present.

Chinguacousy.—Probably fifteen years' wood: coal is used extensively.

## PERTH.

North Easthope.—Would last many years: in fact, where ordinary care is taken of the woodlands, by properly enclosing it, clearing up and removing all fallen and decaying timber for fuel, there is a better opportunity given to young timber to grow, and it does grow rapidly; in short, when proper care is taken in a twenty-acre lot, the growth of young timber will equal the amount consumed for private use. Coal is not used extensively; possibly twenty per cent. of the farmers use it in hall stoves; it keeps the house comfortable during the long and cold winter nights.

Hibbert.—No coal used; with economy, fifteen to twenty years' supply.

Blanshard.—The timber in this municipality can not last more than fifteen or twenty years at the very most; scarcely any farm has more than ten acres of wood left, and

there being no waste land in the township, you can see that we are near the end. Many of the farmers are using coal in their parlors, in order to make the few remaining trees last as long as possible.

Logan.—In Logan are 53,770 acres ; the amount returned to me as being cleared, 40,000 acres ; you can add to that, 5,000 acres, which is cleared and not returned, as the farmers all try to return to the assessor as small a clearance as they can, to keep down taxation, that will leave you about, say 9,000 acres of pretty fair timbered lands. I should say that wood will be used as fuel generally for the next fifteen to twenty years. Out of the above 9,000 acres, the Canada Co. own and have in their possession, 5,800 acres, which is very fairly timbered ; and as they are not selling land or timber, you will see that they have a very large supply. There is not much coal used in this township.

Elma.—There is a sufficient supply of second-class, or soft wood, for over fifty years ; that is, supposing no fire should run through it and burn it down. First-class wood is not in great supply. In our swamp lands, which contain the supply of wood, I am of the opinion that fire will diminish the supply very rapidly, as those lands are all being less or more drained, and when dry are very apt to be overrun with bush fires.

Wallace.—Coal is not used in this township ; total acreage, 49,809 ; acres cleared, 32,591 ; acres of woodland, 6,675. The farmers are not cutting down timber for clearing, except small parcels, where there is some local cause for it. Besides the acres of woodland given above, there are about 7,000 acres of swamp land, from which a considerable supply of firewood may be gathered.

Ellice.—Supposing the wood in our township was used exclusively for home consumption, the timber would likely last for forty years, if no fire were to destroy it in the meantime, but its likely that fires will occur in the near future, as we have had fires which have burnt down thousands of acres of timber where lumbering has been carried on, and in some places the fires ran into woods which had not been culled, on the low-lying lands, where it will most likely catch again, the first dry summer. Very little coal is used in this township, perhaps not twenty tons in a year.

#### PETERBOROUGH.

Monaghan, South.—Little coal used ; should say fifty years' wood.

#### PRINCE EDWARD.

South Marysburg.—Little coal used ; twenty years' wood.\*

Sophiasburgh.—Consumption of coal is increasing ; fifty years' wood.

North Marysburg.—Probably six or eight years would destroy our wood, if coal were discontinued. I might add, that owing to our geographical position, being nearly surrounded by water, thus exposing our woodland to the cold, freezing inclement winds of winter, a great amount of our standing timber is at present in a state of decay, and landowners are clearing off the wood on this account. Coal is our present fuel, and with present prices, will, in a short time, supplant wood.

Hillier.—Many years' supply.

#### WATERLOO.

Wilmott.—Many use coal to some extent ; supply of wood, by careful management, sufficient for the present generation.

Wellesley.—Some coal used ; perhaps sixty years' wood ; 9,000 acres bush.

Waterloo.—Villages and many farmers using coal, one-fourth of the township being in bush and little clearing being done for farm purposes ; with care, the young timber will supply the decrease.

#### WELLAND.

Willoughby.—Probably twenty years' supply.

Bertie.—One-sixth bush ; perhaps thirty years' supply.

Crowland.—Twenty years' supply.

Stamford.—One-half use coal in winter ; twenty years' supply.

Wainfleet.—No coal used ; fifteen years' wood.

## WELLINGTON.

West Garafraxa.—Little coal used ; fifteen years' wood.

West Luther.—No coal used ; forty years' wood.

Guelph.—Coal partly used ; twenty years' wood.

Puslinch.—With careful husbandry, and barring accident by fire and tempest, twenty-five years' supply.

Nichol.—Some coal used ; twelve years' wood.

Arthur.—Little coal used ; perhaps twenty years' wood.

Maryburgh.—Coal somewhat used ; forty years' wood.

Eramosa.—Thirty-five years supply.

Pilkington.—Coal much used ; most farms have six to ten years' firewood.

Minto.—The farms here are nearly all cleared ; firewood obtained with difficulty ; coal must soon be extensively used.

Erin.—Coal little used ; twenty years' wood.

## WENTWORTH.

North Glanford.—2,063 acres of wood returned ; but, I think, that although that number of acres may still be termed timber land, there is not more than one-third or one-half at most, of the amount of timber that originally stood upon the ground, it having been constantly, for years, thinned out for fuel and other purposes. As to coal, it is being pretty generally used in winter for heating purposes.

East Flamborough.—Much coal used ; thirty years' wood.

Ancaster.—Coal considerably used ; the supply of firewood is fast diminishing ; and without more care and economy is used in the future, will be exhausted by the next generation.

Beverly.—Hard coal somewhat used ; if the wood in the township be well cared for, the annual growth will supply the farms.

## YORK.

Etobicoke.—Much coal used ; twenty years' wood.

Vaughan.—Coal largely used ; nine years' wood.

Markham.—Coal much used ; twenty-five years' wood, or more.

East Gwillimbury.—Coal largely used : twenty-five years' wood.

Whitchurch.—Coal considerably used : twenty years' wood.

In noticing these opinions, which are of the greatest importance, one point must be carefully remembered ; that is, that many state the position of the fuel supply in their townships to be such that, with care, they would have wood enough for many years. This is undoubtedly the case. With care to keep cattle out, as remarked, our forest patches would be continually reproductive ; or, which is the same thing, if the cattle be never let in, except when the pasture outside is good. When the pasture is good they will not do the forest much harm. But it cannot be too often impressed upon the minds of forest owners, that the only way to preserve a wood, is to allow a succession of young trees to grow up ; and that if cattle be let in hungry, they will nip the supply in the shoot. A piece of woods, twenty-five acres, owned by the Snell Brothers, the well-known cattle breeders, of Edmonton, furnishes a good instance of this. Here may be seen in full and apposite view—I quote a former description—the difference between the sapling of the forest and the sapling of the field. Here is no longer the maple, no longer the ash of the roadside—stout, many-branched and square of stature. Here, beneath the tall and embowering branches, rises the young maple, scarcely more than eight inches at the base, shooting upwards in sheer and twigless pillar ; dark gray, of mottled skin, seventy feet of height, or more, till its topmost twigs may burgeon into head, whence sun and air may feed the trunk below. Here is the beech, almost equally tall, slim and branchless, pressing upwards, instinctively aware that its life depends on attaining the sunlight.



above. Here is the yellow birch, scarce three inches through, forty-feet in height, destitute at this season of foliage on its few and scanty projecting limbs, and appearing, where a streak of sunlight falls upon its polished trunk, like a slender and rounded pillar of shimmering and dusty silver. All round, everywhere down the forest glades, visible from our carriage, rises many another youthful tree—the elm, the ash, the oak—lofty and beautiful; six-inch stems, every one; all emulously pressing to the light and life above. Every here and there stand the huge and older trees, but sparsely scattered; for this twenty-five acres has, for this score of years, yielded annually its thirty cords of wood to stove and fire-place, and will probably continue to yield as much, as the process of reproduction is being continued in full vigor, and the forest earth is dotted with little seedlings springing up, ready to be trees in turn. This piece of woods affords a good example of the manner in which the forest can be preserved, if care be taken. There are two ways of preventing cattle from destroying the forest; one is to fence them out; the other to keep their pastures rich. Cattle have always had free access to this piece of woods; but the adjoining fields, where they pasture, have always been kept in heavy grass, the cattle never being allowed on the pastures in spring until a rich growth has appeared. The consequence has been that the cattle have gone through the bush when they chose, without any inclination to feed on the young trees. It will be observed that patches of wood so kept are not so liable to suffer loss from wind; the trees originally left at the edge, their trunks weakened by the force of a sun, to which they were unused, would fall; but these could, either before or after being blown down, be removed and used for firewood. The young trees springing round the borders, and growing up exposed to the sun, acquire the form of the low and many-branched trees of the open plain, giving a border which will not itself blow down, and acts as protection against sun and wind, to the older trees behind it. But we must remember, that if cattle anxious for food, had been permitted entrance, they would have destroyed the young surrounding trees in their infancy.

But what my informants generally have in their remembrance, is the manner in which the forest has, of late years, disappeared. It may be trusted that better care will be taken in future; but to state the reasons why it should be taken, let us mention some of the evils to be feared if our wonted course were longer persisted in. We will now suppose that no new plantations are grown and that the firewood is exhausted. Let us calculate the amount this proportion of Ontario will have to pay yearly for coal. We may, not unfairly, take it that these townships will average 350 farmers, needing at least ten tons of coal yearly, which, at eight dollars per ton, would be \$5,600,000. It could by no means be carried for less than that price; and this allowance of fuel is so moderate that, considering the number who would use much more, the total sum could not be less than \$8,000,000 yearly. As these townships will not give more than two-thirds of the growing capacity of Ontario, this would almost equal the whole amount of agricultural products, exclusive of cattle, exported by that part of Ontario. It is plain that so great a proportion of our farm products could never be made up by bringing into cultivation the portion now in forest on each farm. There must be very serious loss suffered, look at it how you will, when the supply of firewood is exhausted in, say, very probably (considering clearing for farm purposes, which always goes on whether intended or not, for woods uncared for and left free to cattle, get to be such an eyesore that they are cut down and the land cropped), twenty years. The account then stands, that in twenty years most of the Ontario farms must pay a rent of from \$100 to \$150 a year for fuel, having as a set-off whatever additional crops they can raise in consequence of completely clearing the land. Those who do not then have to pay this, in consequence of having wood still on hand, will have paid its equivalent in buying coal for partially or fully supplying their fuel from now till then. That is, taking an average; for though many will have plenty then, yet that will be balanced by those who have none even now. But next, it is an important matter that they will certainly not get this set-off of the increased production of crops consequent on full clearing, for, if there is anything well proved by repeated testimony in America, it is that when the woods are nearly or quite gone, the farms do not yield the good return to the husbandman as when such remained in forest. It cannot be too impressively stated that this is not due to the exhaustion of the land by over-

cropping, for neither will bush land yield nearly as well when first cropped as did its adjoining bush land at the former period. It will come to this, then, on a rough but pretty just calculation, that in about twenty years the farms of Ontario must pay \$100 to \$150 each, yearly, for fuel; this not being repaid them by the additional land under cultivation, as experience shows that their crops will be at least so much the less remunerative when the forests are gone.

It seems to me that in this condition of affairs there is but one source for the provident farmer, who wishes his farm to retain its value, to pursue—that is, he should plant a strip of timber, choosing, of course, the most exposed aspect of his farm, and thereby obtaining at once shelter and certainty of future fuel. Such strips should be a hundred feet deep at least. People who have only seen the natural forest, and often only that when it has been thinned by many successive cullings, have very little idea of the quantity of wood which a small portion of land properly planted and given ordinary care, can be made to yield; that is to say, when the trees are placed at about four feet apart each way.

They will then grow to trunk instead of branches; and the same ground, which one tree grown in the open would have occupied with its spreading limbs, might give, in some cases, as many as forty or fifty tall, straight stems, say eight feet apart, after thinning once. After some time, half of these could again be taken, and wood, easily worked and split, procured all the while. Open planting gives trees full of knots; the close planting gives clear timber. It may be understood by this how very different is the return obtainable from ordinary bush land to that which might be expected from a regularly managed plantation. I would like, did space permit, to give my readers some idea of how this is done in Europe, where a forest is reproduced in rotation, an acre being planted for every acre cut; and the trees standing at even distances, as regularly as vegetables in a garden.

As soon as our land-owners actually realize the description of what may be called a wood famine, which must soon overspread America, when the process of culling which now exists has exhausted the areas of valuable woods, planting will commence in all directions. Within a few years, those who are provident and far-seeing enough to commence at once will see buyers approaching their doors, with, "What will you take for so many of those second-growth elms?" or "I would like to purchase a good many white ash from you; I see you have some hundreds there." Those who have grown hickory will be able to get a price for it which will put them forever "out of conceit" with wheat growing. They will find, if judiciously planted and cared for, the wood lot yields more dollars per each acre than any five on their farm.

It appears to me that, though undoubtedly progress is being made, and hundreds now plant trees and care for wood lots who would not have done so but for the efforts made to spread information on the subject, yet this progress will be probably so slow that the twenty years will pass and the evil will be on us before we have replaced or conserved by even one-tenth the amount necessary. What is needed is some general movement by the leaders of the community, and I will suggest one.

If you speak to a farmer who has tried planting forest trees to any considerable extent, he will tell you that though young trees of all descriptions are obtainable in the forest, yet practically, when sought for, it is difficult to find the class most suitable to plant. The forest sapling is generally inclined to spread its roots in a manner which renders it difficult of success in planting, or to send down one long tap root, often very hard to manage. Of course they are often planted out, but with the exception of the maple, an easy tree to move, there is frequently much trouble and many failures. They do not give the decided yearly growth of a transplanted seedling, for the reason that their roots are not such as to adapt themselves at once to the change. The nursery tree is, or should be, twice transplanted when small. Each change gives a greater number of healthy fibres to the roots; and by the time it is planted out ultimately, in its destined position, it should possess a considerable number of root fibres, full of life, which immediately take hold of the soil, and draw such nourishment from it that rapid growth is generally the result. There are many means, too, used with certain kinds of saplings, to improve the roots, and root pruning. The last, by the way, as I have pointed out to my



readers, is possible in the woods. But in a nursery, where you have a large expanse of easily worked earth, and situated, which is a very important matter, in a part of the country fit for the operations you contemplate, the raising of immense numbers of young trees in excellent condition for transferring to other localities is, with proper assistance, so easy a matter as to render it inadvisable to use forest grown trees. What I would suggest, as the only plan likely to give us plantations of forest trees throughout the country in time to meet the scarcity of fuel and timber, which, as shown, is rapidly approaching, is that sufficient appropriation be made to maintain public nurseries, either by the counties where they are most needed, or by the Government, where large quantities of young trees might be grown and distributed free to those who would agree to grow plantations of larger or smaller size. This would not interfere with any nursery business (though even in that case the few must give way to the many); but it could not, for very few plantations are attempted, the trees being generally placed in rows, which will yield shelter, but never a quick, tall growth of timber. They will give the hard, knotty, "second growth," valuable for much, but not for the purposes spoken of here. Let the professional men sell for the purposes they at present provide for; but this other, the great necessity, will not be met without extraordinary aid be given. It is just, too, that the farmers be aided to replant, for the cities have shared in the spoils of the land which has been cleared, and should assist in its partial re-forestation. I have reason to believe, from many assurances, that if such were grown and distributed, they would be, by very many, gladly received and cared for. It is easy, no doubt, to make objections to this plan, but it should be remembered that no other has been found capable of trial. Time goes on, and if no general move be made the country will suffer much. With so many farming competitors we should look to the sources of fertility, and above all, to the great one of tree preservation, the real need of Ontario.

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## CHAPTER II.

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### FORESTRY EXAMINATION OF TWO TOWNSHIPS.

#### NOTES FROM MARKHAM.

Two townships in Ontario, St. Vincent and Markham, have been selected this year for thorough forestry examination, as they were respectively on the northern and southern borders of the Ontario peninsula—the first close to the Georgian bay, the second rather removed from Lake Ontario, but still within its influence. These townships were completely traversed, every concession and side line being visited, and the opinions of all farmers, as far as possible, secured. What was noticed in Markham was that all agreed fall wheat was much benefited by the shelter of trees, and many stated that it was useless to attempt growing it without shelter. All agreed that grass was benefited by shelter, on any side. Some, but very few, objected to the shade thrown to the north by lines of trees. All, as a rule, thought more tree planting was very necessary. Wherever farmers were well read on the subject, and able to plant, they were establishing rows of trees round their farms. It was noticeable that many held the view that a wind-break on the south was as valuable as one on the north. Nearly all agreed that the rainfall was much more variable and distributed in a manner less useful to the farmer than when larger forests existed throughout the land. The general impression left was that Markham, having many farmers possessed of means, would soon have nearly every farm partially surrounded by trees, and that plantations of larger extent might shortly be looked for. Following will be found a great number of opinions from various farmers, all, or nearly all, it may

be noticed, freeholders; from these, if my readers will go carefully over them, much may be learned:—

J. BRUMWELL has a bordering bush of poplars to the east which much benefits crops near. East and west wind-breaks would cast some injurious shade to the north. From north to south not at all. A number thus across the country would be a great advantage.

J. FARR—Wind-breaks would be valuable: would prefer elms as easier to plough near. Of resinous trees cedars are most friendly to the soil. For dry land they should be taken from dry land.

MR. JAMES has two fields protected on the north and east by a second growth of young pines, about thirty-five or forty feet high. These two fields have had excellent crops of fall wheat twice in succession, while the wheat over all the rest of the farm has not been nearly so good, and this, notwithstanding that these two fields have never been undrained, while the rest is well under-drained. Mr. James considers that, though draining is undoubtedly good, yet shelter from trees is better for fall wheat. Even right over the under-drains the wheat often failed, but succeeded with the exception of very small patches, where the bush gave shelter. Mr. James has also a long stretch of young pine wind-break in front of his farm. He finds no injury whatever from the pines near the crops. Would prefer spruce, as it spreads its branches near the ground and thus gives more shelter than pine, which have their branches some height up.

MR. DUNCAN—Bush on the north and west makes his fall wheat and grass much better there. A double row of spruce twenty feet high makes grass much better and heavier that side of the field and a good way across.

MR. MARSH has bush on the north side. No difference in the spring crops, but so much in fall that wind-breaks would have saved nineteen-twentieths of his crop last year, which was so badly winter-killed where unprotected as to necessitate ploughing up nearly the whole.

MR. CICELY finds that the crops are helped by shelter both fall and spring. Has noticed that the grass, where sheltered to the north by a row of buildings, is much better and taller. Has lately planted some hundreds of young cedars three feet high, and though taken from a wet swamp, they have all done well. Is so convinced of the value of wind-breaks that he is about to plant a row along the whole north and west of his farm.

MR. LYNETT has bush on the north and east. Fall wheat is always a surer crop there. The present small portions of bush in various parts of the township cannot give much protection, but lengthy rows of trees would be of great value.

MR. JACQUES, on the celebrated Rennie farm, is strongly of opinion that the presence of woods benefits crops, especially fall wheat, but the others largely by the influence of the moisture in the ground which decreases as the woods are cut. Intends himself to finish out the tree planting in lines on his farm, and preserve all the bush now on it carefully, only using fallen trees for fuel.

OLD MILLER HOMESTEAD—Here is one of the finest wind-breaks in Ontario, a double row of pines planted thirty-five years ago, forty feet high, and three rows of spruce all ten feet apart (the pines to the outside) planted twenty-three years, and now taller than the pine. This surrounds an orchard of about two acres. The clover in the orchard is a heavy crop and grows as thick close up to the trees as elsewhere. The fields to the north and west show no injury whatever from shade, the grass growing as well close up. Mr. Miller, as son of the late proprietor, says: It is of the greatest possible service to the farm. Mr. Miller has planted wind-breaks at his own farm a mile off and would not be without them for thousands of dollars. Would pay that difference if buying a farm. When he went on his place could not grow anything with ease for the wind, which blew his young rose trees to pieces. Has it now well sheltered. Gave the statement that all fall wheat near not sheltered largely failed. Where sheltered on any side, it was a good crop. Fields near here, not sheltered, of ten acres, lost four out of the ten. Would not object to anyone planting a wind-break south of his land; considers the benefit of checking the

force of the wind much greater than the trifling loss by shade. Would be glad to see farmers induced to plant long lines of trees; if done generally it would be the best thing possible for the country.

Mr. MILLER (a namesake) has planted a fine row of pines round his grounds and found them of the greatest possible benefit. These were planted the first new moon in June, which was considered the best time. Cedar he finds succeed well and grow large and fine wind-breaks. Is planting a field, three acres, with maples as a grove. He will fill some of the field, being low, with soft maple and cedar. Agriculture will be almost impossible here unless more trees are planted to check the wind. Believes from his experience that if much of the land were in trees the rest would grow more than now when it is mostly cleared. Has planted a great deal on his place.

Mr. HOOVER—Shelter does not benefit spring crops so much, but winter crops are much the better for it. Sheltered fields have always much the best fall wheat.

Mr. LOWRY has two fields sheltered by woods on the north and partially on the west. These fields he can always depend upon for a crop of wheat. It will grow there with poor culture better than elsewhere with good. One end is exposed and there the north-west wind always kills the fall wheat. All along the rest the wheat keeps good for about forty rods from the woods, when it begins to winter-kill. Mr. Lowry believes that spring crops also are much benefited by shelter of wind-breaks or woods, which he considers keep the moisture in the land after rains. He has planted spruce wind-breaks round his orchard and means to continue it round his farm. Last year all fall wheat in the neighbourhood failed except where sheltered.

Mr. CASTOR intends to plant a wind-break along the exposed side of his farm. Shelter is the great necessity for enabling crops to be profitably grown in Ontario. The north and north-west winds, which blow the snow off the fields, are one great cause of the repeated bad crops of fall wheat.

Mr. HAMILTON—The shelter of woods is of such benefit to all winter crops that as the woods go, wind-breaks must be planted. He has planted a row along one whole side of his farm this spring, using maples.

Mr. RAYNER—Shelter is of great value to fall wheat.

Mr. KLINK—The great trouble in growing fall wheat now is that in April a cold wind comes along and does it harm. Did not notice any difference in spring crops. The shade on the north of a bush would weaken crops for a short distance, but the shelter on the south would assist them over a much wider space. Cedar will grow fast and tall here, and make a much better wind-break than spruce.

Mr. GANTON—Though fall wheat is our most valuable crop, yet it would almost be as well to give it up if no better chance arrives; has tried it three times with little success. Shelter is valuable for it; would be glad to see some means tried to afford it; even for the sake of the roads it would be an excellent thing to try the experiment of wind-breaks, as in winter it is freezing work to travel much now. With wind-breaks travel would be infinitely more comfortable. Has planted cedar on the north, but it failed—will try again.

Mr. WIDEMAN would be glad to see some law which should induce farmers to plant a certain number of trees yearly. A wood benefits fall wheat to a considerable distance; much more than forty rods.

Mr. PALMER—If we are to continue to grow fall wheat, the shelter of trees must be encouraged. Has not known a sheltered field to fail lately with this crop, while in the open failures were common; had this year to plough up twenty acres. A good line of second growth evergreens will give shelter over a wide field. For shade for cattle, too, trees should be preserved. Grass was much better where sheltered by trees. In a field near with rows of young trees along the sides it grew as fast again.

Mr. RUSSELL—Lines of trees would weaken the crop north of them for twenty feet. If fall wheat is to be grown, however, shelter is necessary. His son this year had the best crop in the township, in a field sheltered on the north and west. In fields without



shelter the percentage of crop lost was large. Has not had a stick cut on the farm for twenty-five years except for fuel, thereby saving an excellent bush. The shade of trees is very good also for cattle. Is decidedly in favour of preserving a proper amount of trees. A great trouble in the way of planting wind-breaks is the expense, labour being now so dear.

Mr. LANGSTAFF—Shelter is valuable for fall wheat in especial and to a certain extent to grass. In Essa the only fields to be relied upon for fall wheat were those next the bush. The effect of shelter would be very evident half way across a twelve acre field and would benefit the whole field more or less. This was the case throughout Essa.

Mr. RICEBOROUGH's farm is almost entirely without shelter, although his crops, especially spring crops, are always up to the average. On one field, protected on the west by rows of pines and cedar, his fall wheat was good in seasons when it was killed in the other portions of the field. The soil is clay loam. He has planted a considerable number of trees and would be willing to plant more, especially if the cost of procuring suitable trees were diminished. Has intended for some time to protect the north side of his farm with trees. Is in general in favour of more extensive shelter being provided from the north and west winds, especially for fall wheat. Regrets the neglect he has noticed in the matter of planting timber.

Mr. NOBLE has noticed that his crops are almost always better preserved when they are sheltered by woods remaining on the west. His land has been long cleared. Is strongly of opinion that even wind-breaks would be beneficial in the way of drawing moisture, but does not think that if planted near roads they would have any material effect upon them, as the wind-breaks would not be wide enough. He prefers evergreens, especially Norway spruce, to any other kind of tree. Has had great trouble from cattle upon the roads destroying the trees. He has procured from Nebraska some seeds of the Box elder, a variety comparatively new to Ontario. Is greatly in favour of having lines of Norway spruce planted along the roads, as they would furnish shelter in winter and would also greatly increase the amount of produce. Intends planting along the north side of his farm, which borders on the road, a wind-break consisting of two rows of maples and a row of spruce in the centre. Mr. Noble is willing to expend on tree-planting and is satisfied that his investment will be repaid by the ornament as well as the profit derived.

Mr. ROBERT CANNING believes that evergreens are less injurious in their immediate vicinity to crops than deciduous trees. Finds the protection afforded by shelter on the north-west advantageous. The evergreens are better than maples—for example, because they afford most shelter during the winter when the protection is most needed. Has planted a large number of spruce, mainly for shade and protection, with splendid success.

Mr. HUGH CANNING pointed out the case of one field of fall wheat, protected on the north and west by old woods, where the crop is not killed at all, while another field on the same farm not protected is badly damaged, to the extent of one-third, though the land is of the same quality, both fields drained and both sloping to the north. The country as it becomes more cleared will lose its moisture, the result being that it will not raise fall wheat so well. It is better to have the trees planted on the north and west of the farm irrespective of roads. Likes trees that grow up quickly and would prefer a mixture of evergreens, maples and elms for example. He has had good success with balsams taken from the swamp, which if well planted and cared for, he believes as good as any kind; also maples, a number of which he has planted.

Mr. MORRIS has known cases where the shelter made so much difference that he has better crops in sheltered parts where the soil is comparatively poor. As the woods disappear the climate will become much colder and the land will become dryer. Even the soft maples are becoming scarce for planting purposes.

Mr. McLEAN has some woods remaining as a shelter from the east and south which he regards as no disadvantage, and during some winters a positive advantage to fall wheat from the protection afforded by the coat of snow which could be collected, but in the case

of spring crops he considers that a wind-break on the south would hinder and delay sowing operations. In the case of protection to orchards they would be of great benefit, especially on the north and west. He would plant trees along every road side, as they will not affect the state of the roads materially. In his neighbourhood there is a fixed intention on the part of many to plant to a much larger extent than formerly. Would prefer evergreens in some localities and maples in others. He has planted a number of both kinds, spruce as shelter for fruit trees, while maples are ornamental in summer in places where protection in winter is not so urgent.

Mr. GRAHAM would plant trees on the road side rather than on the farms, but he would require that laws be enforced preventing cattle from being at large. Trees in the roads would be less bother to the farmer; it is the fact of so many cattle being at large upon the roads that has prevented him from planting. He is of opinion that if something in the way of protection by trees were provided fall wheat might yet be successfully grown in his neighbourhood. In his opinion spruce trees would be the most useful. He has cleared some bush off lately and it has had the effect of letting the wind to his neighbours timber, causing very great damage. He is strongly in favour of Government assistance in the way of procuring suitable trees that will branch out near the ground. Cedar suits certain soils only; the Norway spruce has been observed to do well wherever it has been planted. He is satisfied that there is not enough tree-planting being done. It requires encouragement on a more extensive scale.

Mr. ROBERT FRENCH believes that if he had wind-breaks planted on the north-west of his farm he would be able to grow fall wheat with more certainty of a good yield than at present. He has planted out a young orchard and will protect it on the west and north with spruce trees. He has been very unsuccessful with maples procured from the woods. He thinks that the injury to the roads by the trees planted along the road would be slight. Like the majority in his neighbourhood he favours spruce for planting, although soft maples are best for furnishing shade for cattle.

Mr. CROSBY—On low lands soft maples and elms and the native cedar are the best suited for hedges, and better than hard maples. It must be a good plan to plant trees both for ornament and protection, especially for winter crops. Would plant among fruit trees other varieties, such as walnut, butternut, etc. for protection. He is satisfied that the presence of trees on the streets of villages, etc. has the effect of making the atmosphere more healthy. Trees planted along the road can be trimmed up so as to remove any inconveniences from shade to the roads in spring time. There is no difficulty as yet in procuring trees, the native varieties, soft maple, etc., although there is not enough being done in the way of planting. If planted in the proper places the trees might afterwards be utilised as posts for stretching wires on.

Mr. HAGERMAN last year had a crop of fall wheat, part of which was protected by bush on the north. He found it necessary to plough up all the field except the small portion protected and believes that if it had all been protected his crop would have been saved. Trees planted along the roads running east and west would have a bad effect on mud roads. If genuine interest were created in the line of obtaining suitable trees and planting them as protection for exposed parts of the country it would have a highly beneficial effect, increasing the amount of produce as well as improving the general appearance of the country.

Mr. VINCENT JOHNSON—For the last two years whatever fall wheat was saved was in most cases due to the shelter of bush. Lines of evergreens would do but little harm by shading a small strip of land compared with the benefits obtained. He would raise more grain on his farm by allowing one rod along the north for the purpose of furnishing a wind-break. He prefers evergreens. Has had wheat protected on the north-west and noticed that it has been ripe earlier, and the grain has been plumper.

Mr. JONATHAN SLATER—Shelter from woods is beneficial, principally in the case of fall wheat and grass, although the moisture that is in the soil adjacent to woods improved other crops as well. The protection from high winds is beneficial to crops at a distance of a quarter of a mile at least. The advantages of having trees planted on the roads far



out balance any drawbacks that may occur. The disadvantage to the roads from trees planted on the south side would be greatest. Has thirty acres of bush remaining and has not found it necessary to plant, except for ornamental purposes. His woods are becoming thin; he is endeavouring to preserve them by keeping cattle out altogether. Government should interfere in the wholesale destruction of woods that is going on in the way of compelling those who cut away timber to plant other trees to replace it, a plan which is followed in some parts of Europe.

In Mr. GONIE's neighbourhood good timber is becoming scarce. He would be in favour of some plan by which evergreens might be furnished to form wind-breaks.

Mr. LEEK has not planted any trees and does not believe that rows of evergreens would furnish a sufficient wind-break to be of any material benefit. They would also take the strength of the ground and stunt the crops in their immediate vicinity, though he admits that the bush he possesses, twenty or twenty-five acres, has in different cases preserved his fall wheat.

Mr. JOHN CLARK, Headford, considers the presence of trees an advantage to crops as well as a shelter to buildings, fences, etc. He has found them a benefit to crops of fall wheat. His own intention is to plant to protect his house and garden, which are built on an elevated spot, but would not go to any great expense in the way of planting systematically for shelter to crops.

Mr. SANDERSON—Cedar is as good as Norway spruce and it can be procured quite easily. Cedars are quite as good on high land as low when once they are started; he can point out cases of the cedars growing to the height of from 10 to 15 feet on high land.

Mr. FICHELDER's woods shelter fields from the north winds and protect his wheat in seasons when it is killed in other places. Has planted maples on the east front of his farm, some of which have been killed by cattle on the roads, also by vehicles being driven along the side of the road. If he had a wind-break planted along the north side of his farm it would be a great benefit to it. Has planted a number of walnuts in his woods with a view to profit from them in the future. A small number of pines were planted, but all died. Has planted spruce for a wind-break for the house and garden.

Mr. MILLER had fourteen acres of wheat sheltered on the north and west by woods on land sloping west, of which about six acres was saved by shelter from the bush. A considerable part of the woods was cedar. His land is rather low, heavy clay, and undrained, fifty rods of shelter on the north have been chopped off last year, rye sowed in this is rather a poor crop. He has planted cedars to a large extent (500 rods) on his farm which he intends to use afterwards as fences, though some of them have died. Some were planted close for a hedge, others four or five feet apart. He considers that cedars suit his land best—they are hardy and furnish shelter in winter, as it is only in winter that shelter is needed. In low, wet land they must be planted top of the ground with some soil thrown on the roots, otherwise they die; they grow slower than spruce.

Mr. F. ECHARDT has a fairly sheltered field which raises wheat every third year. Last year was the first time that a failure occurred and this on only about five acres on the least sheltered part. Another field (thirteen acres) south of it unprotected, was all ploughed up. In his lane, part of which has pine trees along it on north, it is always clear of snow when the rest of it is drifted. Regrets that he had not left a row of trees wherever he had a fence. Has a swamp lying to the east of his orchard which has been a protection, though he would rather have it to the west.

Mr. PRINGLE does not consider the protection of a swamp wood that he has on his place of any material benefit to the crops; it affords however a shelter from the west winds to his house and buildings. The path runs along the south edge of the swamp and in winter is protected from snow drifts.

Mr. WILLIAM LATIMER has no woods on his farm nor shelter from trees of any kind. He sowed six acres of wheat the last two years, and lost the crops from the effects of winter-killing. Two of his neighbours had wheat saved, but in every case it was sheltered

in some way. Another neighbour who has no bush has not sown fall wheat for the last two years on account of failure before. Is strongly in favour of tree-planting for ornament and shelter. He pointed out a short row of cedars closely planted along a fence sheltering a field of his which lay to the south; when he had wheat or grass on this field, about six or eight rods from the fence was good, the rest killed.

Mr. ALEX. PRINGLE has twenty acres of bush on the west side, and half of his farm is protected by a row of trees left running north and south to the south of his bush. Last year he had fifteen acres of fall wheat in the field lying to the east of this; seven and a-half acres nearest to the woods were a good crop, the other entirely killed. The effect of the woods extend over ten acres at least. The land is drained and slopes to the south. In his neighbourhood many are planting maples for protection to gardens, orchards, etc., from the north winds. Would prefer having the trees planted on the road. Has planted trees, but they have not reached a sufficient height to be of benefit to crops. The benefit of shelter is confined to fall crops.

Mr. SUMMERFELDS has examples of fields sheltered on every side. One small field is in fall wheat, protected on the south-east. It is not killed out, but the land is new, low and swampy, which has kept it backward. Most of his land that lies between the bush is pasture, and grows good pasture.

Mr. C. HOUCK has twenty acres of woods sheltering the east side. He cannot see any benefit that is derived from woods on that side. He sows fall wheat seven or eight acres each year. Occasionally it is good. He points out a case where shelter was a benefit on the north, a field of a neighbor so sheltered being the only piece of wheat remaining last year.

Mr. NICH has protection on the west from old woods. A couple of acres farthest away from the woods has been killed in fall wheat, the other eight acres remaining. He has planted 125 spruce trees, all living, to form a protection to buildings. He would prefer evergreens, especially Norway spruce.

Mr. JOHN BRUCE gives an instance of a farm sheltered by a belt of trees about one-eighth of a mile wide and over a quarter of a mile long, sheltering fields on the south, and never in any case has he seen the fall wheat fail when so sheltered. He has often noticed that a shower divides when there happens to be a clearing of any extent, each part following the wooded country. Trees are valuable as conductors between the atmosphere and the earth, and tend to preserve the moisture; the effect of clearing too extensively is to produce sterility and drought. His brother bought a farm to the north of him in order that it might not fall into other hands, and the timber be cleared off. He does not believe that coal will ever take the place of wood for fuel.

Mr. BURTON's farm lies facing the east, with the town line along the north. He has thirty acres of bush on the west, and the benefits of which he has found to be so great that he has commenced planting a wind-break of maples and spruce along the north side. He believes that cedars could be planted out at a small expense. They would grow to a sufficient height to make a good wind-break. Basswoods are not injurious to the land; he has one here and there scattered through his fields, and will preserve them by all means as shade for his sheep and cattle. He is satisfied that anything in the way of planting must be done on a thorough plan, not in patchwork as formerly. A solid cedar hedge, backed by woods, has grown so high along the line to the east of his farm that they begin to affect the roads, but he would strongly object to having them cut down, and would only trim them to the proper height. It is only for a short time that the roads are kept damp in the spring. In his orchard, which has until just lately been entirely unprotected, many of the fruit trees have been destroyed by frost. The frost split the bark and ruined the trees. Also wherever the blossoms have been protected in May the fruit crop has been good, a slight frost at this time of the year having ruined the prospects in the case of unprotected trees. He prefers planting the trees on his own premises as close to the line as possible, with the view of forming fences when large enough.

Mr. RAYMER believes in cutting out the big timber and leaving the smaller. He thinks this is the best way to protect. The people are themselves to blame for slashing out all the timber.

MR. MARTIN WIDEMAN has about twenty acres of bush on the west; wheat sown beside it was killed on the side farthest from the bush, one-quarter at least, and even then he believes the bush saved it to some extent. Bush on the south he considers a disadvantage; he would rather have it away.

MR. REESOR lost six acres of wheat which was not sheltered. Would be willing to plant trees if any laws to that effect were passed.

MR. C. B. HOOVER—The grain is always plump wherever it has a tree, whether orchard or a single tree, in the middle of the field. Has observed instances where shelter saved fall wheat, while all exposed near was killed.

MR. JOHN WILLIAMS has a row of spruce along the north of his buildings perhaps ten rods long, planted about twenty years ago. They form an admirable wind-break for the buildings.

MR. HOOVER has forty rods of spruce, twelve years old, along the west side of his orchard, about twenty feet high. They form a protection when the fruit is nearly ripe. On the east side of the orchard there are woods which shelter it from the east wind. Five or six feet from the spruce wind-break the grain does not do so well. They don't branch out far enough yet to do great injury. He considered them especially beneficial to buildings and fruit trees, but not so much to crops.

MR. T. WILLIAMS has a wind-break by about sixty rods long, consisting of spruce and cedar about twenty feet high, which he considers worth a thousand dollars to his farm. It runs along the north side of his orchard, and invariably protects the fruits, when in no better orchards it is destroyed. He considers spruce trees the best, and next to them, cedar. He is preparing to plant spruce along the north and west of his farm. He will have nothing but wire fences in order to get on the land ten days earlier in spring. The trees did not keep the land wet in spring because the snow was of even depth. He can work the land on the north of his wind-break as early as anywhere, while on the south it is always much earlier. His opinion is that the Government should provide trees free to anyone that will plant them. Unless trees are planted for shelter there will be no use in sowing fall wheat.

MR. MILNE has ten acres of fall wheat on clay land, protected on the north by a bush; of fall wheat and maple; about five or six acres near the bush is a good crop; in the rest fully half is killed out. He attributes the difference entirely to the shelter of the trees.

MR. ROLPH has noticed the general benefit to fall wheat wherever it has been sheltered on the north and west. In a field of his which has woods to the east he considers that the shelter has in many cases been an injury. The field was drained, but the woods kept the snow on so long that the wheat was weakened. In the case of spring crops, the field near the woods seemed always inclined to rust. Evergreens are the best shade if raising fall wheat is the object, or for meadows.

MR. WOOD rents his farm, and considers that any investment in tree-planting would return no profit unless leases were extended to a much larger period than at present. He prefers evergreens, when properly trimmed, to maples.

MR. GEORGE ROBB has planted a row of spruce about twenty rods long on the north and west of one set of buildings. Planted about twelve years, now average twenty feet in height. He finds great benefit from the shelter from the orchard, especially from the frost; the bark does not split from the effects of cold weather. Along the east side of the farm there is old woods extending about eighty rods, also on the north about the same. The east wind is kept off, but the east shelter is no great benefit. He believes that the clearing has had the effect of injury to the land, nor have we now the same showers as formerly. Evergreens, especially spruce, are preferable. He has planted 160 rods of maples.

MR. JOHN YOUNG, for the last two years, has sown ten acres of wheat unprotected by trees, and had to plough it up in both cases. His land is all drained. He has noticed that as a rule the fall wheat has been better when sheltered by woods.



Mr. ROBERT CUNNINGHAM has three acres of woods forming a shelter on the north-west. The field (14 acres) next to it had fall wheat on last year, and it was all ploughed up except about two acres sheltered by the woods. He attributes the difference entirely to the shelter. The field sloped to the east; it was so high that it did not require draining. Wind-breaks on the north are beneficial for the crops. He intends planting all along the road maples two rods apart. If planting on his own land, along the roads at least, he prefers the white ash to evergreen, but for a wind-break the evergreens are the best.

Mr. SMITH has noticed the general benefit to fall wheat from shelter on the north and west. He considers that lines of evergreens would take up too much land to be of any material benefit to the crops, that is, if they are thick enough to become a wind-break.

Mr. HOGG considers that land gets dryer and poorer the longer it is cleared. This is to be accounted for mainly by the removal of the woods. Norway spruce would give the best shelter, and would grow best on his land, sandy loam. He does not think that the trees would injure the roads.

Mr. THOS. BROWN has seen fields of wheat totally destroyed where there was no shelter, when in cases where there was wood the crop was saved. Where the land is drained it will do better without shelter than land that is not. Wind-breaks will make land comparatively valueless for grain as far on the north of them as the shadows are cast at midday. Evergreens would do best, as the shelter is needed in the latter part of April or the beginning of May, often the most trying time to fall wheat.

Mr. JOHN TRUDGEON has ploughed up his wheat for the past two years; unsheltered. He believes that the land as it becomes more clear retains less moisture. Wind-breaks along the road would do no injury, but he would plant them along the north and west to be of benefit to crops.

Mr. ISAAC BRUMMELL—This spring sheltered wheat is comparatively good; where it is exposed it is killed. He has no winter wheat. He has seen in a cold spring that spring grain sheltered does better. He has not planted trees as shelter, but considers that he could select trees that, if planted along the north of his farm as wind-breaks, would repay the cost of the ground taken up. He would prefer evergreens because they afford a shelter at every season of the year.

Mr. WILLIAM LEWIS—An orchard stands in the north-west corner of a field, and every time he sows fall wheat in this field he is sure of a crop, and the wheat fails in other places. No difference in the draining or slope, though if anything, other places of the farm have the advantage in the way of rolling land. For general benefit he is in favour of tree planting. He believes that any loss of land that is taken up by a wind-break would be made up by increase in the crop on the rest of the farm. He would prefer to see them planted in a zig-zag manner. Evergreens are preferable.

Mr. STOUTENBURGH says that he found the benefit of a bush one and a-half miles long along the north of his farm with a road between. He never had a failure on any part of his farm in fall wheat while this remained. His wheat as a general thing is damaged since this was cleared up. He has a bush on the south of him; it is no advantage, though not an injury. His land is pretty much drained. His orchard shelters his crop to the extent of fifty rods in fall wheat; other grain needs no shelter. Is strongly in favour of some plan by which lines of trees might be planted out through the country. Has seen the showers fall on the ridges and where the woods are. Nursery trees will grow much quicker and surer than trees got in the woods. Pine trees (half a dozen, fifty feet high) on the north side shelter the wheat twenty rods in a streak. A wind-break running east and west will be no injury whatever to the farm north of it.

Mr. JENNINGS has planted eighty rods of maples on the inside of the fence. He has tried Manitoba maples, but they grow too much from the roots in the way of suckers. Prefers tamarac, cedars and balsam mixed. Cedars twenty-five years planted have been thinned off several times. They are large enough now for posts. Would plant rows of trees mentioned above along the north line; they would form a wind-break, but they

would take some nourishment. The crops, however, that he has on the north of a line of tamarac and cedars are as good as in other places. Trees should be selected that will afterwards form fuel in case they ever blow down, or if they should die. Cedars will grow on any kind of ground, high or low; has never lost a cedar that was properly planted. Any means by which trees might be furnished at less expense would be a great benefit to the country. Nursery trees are to be preferred to those taken from the woods. The ground must be prepared for planting any kind of trees so that the roots will have a chance to spread. Planted some hundreds of willows as a shelter for orchard and garden, most of which he has since cut down; found them a nuisance. The effect of the sun on the south of the wind-break impoverishes the land more than the shelter on the north. To form a wind-break he would plant two rows of trees.

Mr. MILLIKEN considers that what is needed is lines of trees across the country. He has on his lawn some fine specimens of Norway and native spruce. He has found the shelter of woods is very valuable for fall wheat, and, in fact, beneficial to crops generally. Is planting a line of Norway spruce and cedar along the whole north of his farm, having it in great part finished now. Planted at five feet from the fence, but considers that he planted it too close, as the branches soon need more room. Has about twice too many trees in it, which will give him every second tree to take up and replant. Believes that if a number of farmers would plant rows, the benefit would be very great. Has a row of pine about thirty feet high. The benefit from these would extend nearly across a square ten-acre field. Finds the second week in June a very good time to plant evergreens. A young spruce brought by him from New Brunswick (native there) seems of a better foliage than either the Norway or Canadian. Considers that shelter from the south-west side is also often serviceable, especially in preserving apples from the strong fall winds which are apt to blow them down.

Mr. HOOD—Shelter is very necessary, not only to fall wheat but to spring crops. Has grass, where sheltered by a line of trees, a foot higher than where it is not, and in a field of about seventeen acres, largely in clover, and having the shelter of a wood on the north and west, where the shelter exists the clover is very high and rich, while elsewhere it is very poor.

Mr. REESOR, Sen., states that shelter is always valuable to both spring and fall crops. Where the shade of the trees extends there will be some diminution in the crops, but nothing compared to the gain derived by the rest of the field. He and his family have planted very largely, being convinced of the benefit of wind-breaks. Is of opinion that the roads are excellent places to plant on, as it shades the crop less, while the shade does not to any great extent injure the roads. Pointed out a considerable length of road so shaded which was but little if any injured, while, on the other hand, the shade was very pleasant of a warm day. A field close by on the Reesor property, sheltered on the east by forest and on the west by a row of young maples, has now one of the best fall wheat crops in the township—a dense mass of wheat ears extending from fence to fence.

Mr. COLIN REESOR—Shelter is almost indispensable in many seasons for fall wheat. He had thirteen acres last year exposed on the north and west, which was completely killed out and had to be ploughed up, while a field near by, sheltered by woods on the north and an orchard on the west, had one of the best crops in the township. Trees on road do little or no harm to the road.

Mr. MILROY—The presence of trees as wind-breaks is of the greatest value to crops. Instanced two cases in which the portion of a crop of fall wheat, sheltered by a bush on the east, was saved, the rest a failure.

Mr. ROBERT REESOR—Shelter is what is needed for crops in this township. The Norway spruce is by far the best tree for wind-breaks. The shade necessarily thrown on the north is of no consequence compared to the benefit to the field.

Mr. ABRAHAM STRICKLER—What injures the fall wheat principally of late is the sharp freezing winds which sweep across in April where there are no woods left to shelter the crops. Wherever shelter exists for crops can be looked for, where it does not, half a crop. With reference to spring crops they are not benefited so much by shelter,



except to protect them from spring frosts which often occur, and are greatly mitigated in their effects by shelter. Wind-breaks also make a difference in the atmosphere of four degrees. The best wind-break is cedar, which, if not the most ornamental, is the most lasting.

Mr. MUSTARD—To be of use the wind-break should be of evergreen and several trees in depth. Most damage is done in April, when warm weather occurs, and sharp frosty winds following. The sudden change seems to weaken the wheat, which appears dead or decayed. The only chance is the obtaining shelter by means of trees, which also would prevent the snow blowing off the fields, and thus causing winter-killing.

Mr. PIKE—The winter crops badly need shelter, the want of which has been undoubtedly the cause of its failures of late. For wind-breaks, cedar and spruce are equally good.

Mr. GROVE—Wherever fall wheat was not sheltered by woods of late, a poor crop was frequently the result. Believes also, from observation, that all bodies of trees draw rain in summer and are valuable thence.

#### NOTES FROM ST. VINCENT.

In St. Vincent, south of the great chain of northern lakes, the conditions are different. Here, fall wheat was not mentioned as needing such shelter, or being so much improved by it. In Markham, near Lake Ontario, freezing winds in March and April were complained of as destroying the fall wheat—these winds, it will be noticed, passing over vast stretches of land, much of it still snow covered. In St. Vincent, on the contrary, the north and north-east breezes passing over the Georgian Bay, seemed to be deprived of this destroying power, and though shelter is still to a certain extent valuable for fall wheat, it does not appear so indispensable as on the Ontario shore. On the other hand, in both townships, great benefit appears to be derived from the shelter of either forests or lines of trees so far as grass is concerned. In St. Vincent and the bordering township of Euphrasia, many fields were passed where the elms after clearing had sprung up all along the fences, and now formed a natural wind-break thirty or more feet in height. Where grass was grown so protected, without exception, it was good; the protecting trees generally doubling the grass crop. Throughout this northern township, the farmers interrogated, comprising the great bulk of the community, stated that close to the shade of wind-breaks or forests their crops were weakened, especially to the north of the lines of trees. But without exception they admitted, what was evidently the fact that their township was drying up by over-clearing, and a greater amount of tree-planting would be beneficial. St. Vincent, it may be remarked, occupies in great part an elevated situation on high mountain ranges and the loss of fertile soil through washing, owing to the mistaken clearing of the summits of the hills, is often evident. Finally, what is the sum of all the observations of both townships is this, that much encouragement, whether in the shape of bonuses for trees planted, or in the shape of the gift of numbers of young trees, of a class and quality better than the woods afford—must be given to induce a sufficient rapidity and generality in planting trees in Ontario.

JOHN B. FERGUSON, 1st line—Fall wheat is much the better of shelter near; spring wheat crops not so decidedly so. More trees would be beneficial in obtaining summer rain; showers follow the lake or wooden stretch of country along Beavef River. Since forestry has been written up, quite an impetus has been given to tree-planting. Evergreens are hard to grow here; maples easy. Thinks of planting a good deal of ash

Has some young ash trees from which every year falls much seed, producing so many young trees that they are ploughed up by hundreds in the fall. Cut one down lately and found the timber excellent. Would have planted much before now, but the short season has been too crowded with work.

Mr. NOBLE, 3rd line, has land sheltered, but cannot give its effect on fall wheat, as it does not succeed in his neighbourhood. With spring crops is of opinion that shelter gives the crop more lasting benefit from showers, as the ground does not dry out so fast. Maples do not succeed here so well as alone.

Mr. WHITE, 3rd line, has witnessed the effects of loss of forests in this region, in the decided diminution of the number of showers in summer and lessened fertility of the land.

Mr. TUCKER, 3rd line, has noticed scarcity of summer rain since the bush was cleared up. Wind-breaks on the north and west are the things needed here—the force of the wind being great. Has planted many evergreens, but a number of them failed. Has succeeded well with maples, with care, but others, who were not careful, lost every tree. We noticed that one of the best crops of spring wheat observed was growing here under shelter of the bush. It had once, however, he said, rusted there.

Mr. WHEATELY, 1st line, is much in favour of planting forest trees, but has been too hurried to do as much as he would wish. Measures must be taken to form wind-breaks, both on account of the force of the wind here and the inferior supply of summer rain, consequent on loss of forest, or the country here will lose much of its fertility.

Mr. HARTMAN, 1st line, has taken particular notice of the effect of the shelter of his bush on the grass near it, and find it twice as good a crop, but a little coarser grass than where unsheltered. The late writing up of forestry matters has had a good effect through much of the country. Has planted a good deal himself, and has a beautiful wind-break of the locust or Acacia twelve or fourteen feet high and 100 yards long, which he says is of such benefit already as to show its value if extended. Is about to plant a belt of ash and other trees, three rods wide, along most of the north of his farm. Will use basswood, if possible, for the sake of the bees.

Mr. MACKAY, 1st line—Grain grows much better on the south side of a line of trees; not so good on the north side; finds grass grows well on either side; would plant trees on the north side of a farm; would prefer evergreens on account of winter shelter. His apples blow off badly; intends planting trees all round his orchard.

Mr. CROOKSHANK, 1st line—If trees shade the grain too much it will not grow well; but would like to have a line of balsams along the north side of his farm.

Mr. MCKITTRICK, town line—Trees are a benefit to meadows, especially when on the north side. His peas were on the south side of a bush this year; finds they were better near the bush; has wheat growing with a bush on the south side; finds it very short for about twenty feet from the fence. Thinks maple the best tree to plant.

Mr. MCCAUSLIN, 1st line—The ground dries up much faster now after rain. The rain falls much heavier than it used to but not so frequently. Grass grows better where it is sheltered; grain grows as well, does not think it fills quite so well in the shade. Intends planting trees all around his farm, would prefer evergreens; thinks elms easier to grow. His fruit is blown off badly since the wind gets such a sweep at it.

Mr. CHRISTIE, 3rd line, finds that the winds have now so much sweep that wind-breaks are becoming absolutely necessary. He proposes trying the poplar, either Lombardy or silver, in a long line on two sides of his farm, with, if procurable, a line of evergreens in front, which would fill up the gaps below. Thinks planting one of our chief needs.

Mr. RICHMOND, 3rd line—Climate much altered since clearing the forests; new land will not now yield the same crops; the wind has a much greater sweep than formerly, and would approve of wind-breaks on the side most exposed, but finds that where woods are on the east side the crop is subject to rust.

Mr. FOSTER, 3rd line, is much in favour of planting wind-breaks. Since the forest is being cleared there is not at all the same amount of rain falling when needed in summer. Wind-breaks would be valuable as shade for cattle.

Mr. MONTGOMERY—The chief noticeable change in the climate is the blowing of the snow in winter. The use of wire fences has not, he thinks, greatly helped this.

Mr. LATIERNEY, 3rd line—Climate much drier in summer of late years. The planting of trees is an excellent thing, but finds it difficult to grow them on hard clay. Has tried mixing building sand without effect.

Mr. ALMAN, 3rd line—Much difficulty in growing trees on the hard land. Has bush on the west side; but thinks the wheat near it is apt to rust. Is not certain of the general benefit of wind-breaks to fields; would approve of one near his orchard, but has not yet had time to start it.

Mr. FERGUSON, 3rd line—Evergreens would be the best to plant for shelter, as it is in the winter they are needed. Clearing makes the climate drier.

Mr. JAMESON, 3rd line—Wind-breaks are the only method of replacing the shelter of the woods, which are now fast blowing down here.

Mr. LAMB, 3rd line—Winds very heavy and sharp since the woods are going; is in favour of lines of trees along the borders of farms.

Mr. CARNAHAN, 4th line, has some fine, tall rows of elms and maples along the road side; being large and spreading, these weaken the crops of cereals under them, and perhaps twelve feet beyond. They stand north and south. Has some rows of trees standing east and west, which do not at all injure the crops close to them. His farm, he finds, always possesses sufficient moisture in the land, with a fair season. Intends to grow grass crops on that part of the land under and affected by the shade trees, and considers the shade will be very valuable for cattle.

Mr. DOUGHERTY, 4th line—The planting of rows of trees is advisable as, if something is not done, the present forests blowing down so fast here will in twenty years leave the country quite bare. Finds the winds very severe on fruit trees especially. It is no use trying to grow fruit without shelter here.

Mr. ELFORD, 4th line, has some fine rows of elms, but too close to one another, and has just cut one out in consequence. The near forest preserves moisture in adjacent lands, but does not notice this effect from single rows of trees. Has a portion of land of small value for crops which, if planted with trees and left for cattle, there being a spring there, would be of great use. Many such exist in the country, which should be so treated as the best hope of the farmer will, in future, be stock.

Mr. CHARTERS, 4th line—A line of trees along the exposed east side of a farm would greatly benefit as shelter. Close to the bush on the north, crops are not injured, close to one on the south the shade injures. Mr. Charters has a long line of hedge bought as buckthorn, which proved not to be genuine, and though pretty, is not very valuable. He has, however, two trees of the genuine Canadian buckthorn, from the seed of which he will raise many young plants. These trees are eight feet high, with plenty of strong thorns. They will make an excellent hedge, and what is important, they will thrive well in high land.

Mr. CLARK, 4th line, is much in favour of tree preservation; means to plant a hill-side in front of his house with evergreens. Has a portion of pasture surrounded by bush on three sides and a hill on the other, and finds that there they can pasture cattle in April, the grass being a month in advance of that elsewhere. Two sides of this are not his bush, but he means to plant evergreens along the edge now so as to be secure if his neighbours should clear theirs up.

Mr. W. WHITELAW, 4th line—Shelter is needed on this line, the situation being high and bleak. Some arrangement should be made with telegraph and telephone companies to wire on one side of the roads, leaving the other side free to plant trees on so that they need not cut them in placing wires. The Township Council had adopted the tree planting act, and this would give an impetus.



Mr. YOUNG, 4th line, finds—his land lying in a slope downwards from the east to the bush—that crops close to the bush are softer. Shelter of some sort, however, will be needed as the woods go; they are going fast now.

Mr. LOBLAW, 4th line—Crops close under the shelter of a bush to the west are soft and slow to fill; to the east not so. Planting the trees in wind-breaks thirty feet apart, sufficient sun would strike though to prevent any injury from shading. Fears evergreens would not do on this elevated land, but maple, ash and basswood would do well. Fall wheat cannot be well grown here since the forests are largely cleared.

Mr. W. YOUNG, 4th line, is much in favour of preserving a supply of wood, and is growing ten acres of second growth with that view. If a farm were divided into ten acre fields, and sixteen or eighteen trees left along one side of each, they would be no detriment, but a benefit. The country is not nearly so healthy as when better forested; if the present woods go it will be much worse. Cattle on the roads will not prevent ash from growing. Has a row of fine trees of that description ten years old.

Mr. GUY, 4th line, has preserved several fine rows of trees, besides a large portion of forest, so that much of his farm is well sheltered. In consequence he has the finest grass crop noticed, being much of it full four times as heavy as great part of that seen elsewhere. His other crops are also good. The cutting down of so much forest and planting no trees is ruinous. Though a near bush or a near wind-break may hurt some wheat under its shelter, yet that damage is many times overpaid by the benefits to the rest of the farm. Is heartily with the tree planting movement.

Mr. JOHN PARKER, 4th line, finds as the bush goes the climate becomes much more disagreeable, cold winds in the winter and spring being frequent and injurious. Lives in a sheltered place and finds a different climate in leaving the vicinity. Preserving bush or planting shade trees is very valuable to the country.

Mr. HUNTER, 4th line, finds since clearing is general, say twenty years, the summer climate, so far as regards rainfall, is not nearly as favourable to farming—the rain being now variable—sometimes very wet, sometimes the opposite; also the wind is troublesome. As for lines of trees he does not like them near a crop, but thinks that thirty feet apart they might not injure; also does not like them near roads, which in this locality they keep damp; but believes that all through this country there are many portions of land which, if they had, after a crop or two had been taken off, been while yet fresh planted, or allowed to grow up in good undergrowth, such as elm, ash or maple, would have been by this time more valuable for their timber, than any crops they can now produce. These would then have aided in improving the climate.

Mr. THORNTON, 4th line, has a line of elms twenty feet high, west of his orchard, which is of great benefit to it, preventing fruit from shaking off with the wind particularly. It will be, he thinks, absolutely necessary to plant trees here. Maples and ash rather than elms, as they stand straighter, while elms get a bend with the wind.

Mr. ABERCROMBY, 4th line, finds the climate changed for the worse by clearing. Finds a bush to the west injures crops close to it. Considers it very important to have trees and shade for cattle, if for no other purpose. Has a line of trees he would not lose for a great deal.

Mr. PETIT, 4th line—Would be glad to see each side of the road planted with trees. It will not keep them damp if they are properly turnpiked, and would be of good to the country. Summer rains much fewer since the country was cleared.

Mr. KELLY, 4th line, considers that those portions of a farm otherwise of little value had better be planted, as undoubtedly we should provide for timber and shelter, but does not like lines of trees, as they seem to weaken the crop by some feet each side.

Mr. JERROD, town line, favours trees on roads, as if turnpiked they would be dry enough. Finds a loss on crops close to them, except grass, which is benefited.

Mr. LOUCK, 7th line, finds that the trees are valuable for grass, and would encourage them on roads and dividing lines.

Mr. BIRCHELL, 7th line—Though little fall wheat is grown here, Mr. Birchell, who has a piece of land with a hill to the east, trees to the north and west, never fails of a good crop, and has an excellent one there now. Last year's gave forty bushels to the acre. His orchard, which is sheltered by tall trees across the road, and well shaded by its own trees, has a very heavy crop of clover. Plum trees, he finds, do not do so well when twenty feet from a line of poplars sixty feet high; at thirty feet they do well.

Mr. CHAPPELL, 7th line, is planting out long lines of maples. He does not, however, consider them necessary generally, as he fancies the young undergrowth springing up along fences and elsewhere, if preserved, will be sufficient.

Messrs. LOUCK, 7th line—Trees by roads will do no harm to the roads if planted 30 feet apart. Evergreens would answer best for shelter, but little tried here yet. Ash, maple and elm grow well. There is an idea that elm trees draw the land, but from experience they do not believe it.

Mr. MATTHEWS, 7th line, is much in favour of planting trees along roadsides, as it both affords shelter in winter and shade in summer. Does not think it hurts the roads. Thinks that along fences, close to crops, they draw the land, rendering it poor for a rod or two in width.

Mr. STILL, 7th line—Difference in climate perceivable is less showers in summer and exposure to cutting winds in winter, since clearing is general. The effect of trees on an adjacent crop is to weaken grain for a short piece; on grass to benefit it. Trees by roads do not keep the roads from drying to any injurious extent.

Mr. COOK, 7th line, finds showers less since clearing, and wind very piercing. Trees by a grain crop weaken it under the trees, but is not able to say as to the general effect on fields. Close to woods rust is likely. Much more tree planting should be done.

Mr. GOOLD, 7th line, finds that close to forests or lines of trees there will be loss both of grass and grain, more immediately under the shade than elsewhere. Where the trees stand perpendicularly there is little loss. Would not, however, do without trees, as probably they have much to do with keeping moisture in the earth, and they certainly check winds. Would plant lines on the south side of roads and on all inferior land on each farm. The shade of the trees on the roads will do little harm, or none, compared with the benefit. On the north they shade land to an injurious extent.

Mr. SAUNDERS, 7th line, considers that while both woods and lines of trees weaken crops under their shade, they yet benefit much more by their presence. Would like to see the inferior land of each farm in trees.

Mr. ELLIS, 7th line, finds crops much poorer since the country is much cleared. Believes lines of trees would help; they weaken crops in their shade, but give a beneficial moisture to the whole field.

Mr. McKAY, 7th line, is much in favour of planting lines of trees; crops poorer since the country is cleared; climate much changed; less snow by half; springs not so favourable to vegetation. Thinks woods on a farm, though injurious to crops directly under their shade, very beneficial to the farm generally. Approves most of maples or evergreens.

Mr. MACKEY, 7th line, considers it the greatest mistake to clear up so much of this country. Has been settled here fifty years, since Mackenzie's rebellion. Has noticed often that when a stretch of country is cleared the country dries up, whereas the contrary is necessary; when the trees are gone rain is much more needed. Lines of trees should be planted everywhere possible, and all the waste places left in wood. On his own farm, leaves one-fourth in woods and does not clear the swamp. The great need is to keep the wind from drying out the land too fast, and trees are the only means of doing this.

Mr. BOYCE, gravel road, finds, since clearing, the wind dries the moisture from the ground much quicker. Has woods to the south and west, grows all crops well right up to them, and particularly good grass—last year his timothy there being nearly six feet high.



Mr. C. LEVINS, gravel road, finds the sweep of winds, since the forest is being cleared, such that wind-breaks along the west would be of great benefit.

Mr. JOHN LEVINS, gravel road, does not like lines of trees to the south, as they weaken vegetation under their shade, but on the west would like them. A road through a bush will be slow in drying on account of the trees each side, but second growth trees along a road (of which Mr. Levins has some fine long, tall rows), will not keep it damp at all, or have any injurious effect.

Mr. SAMUEL EAGLE, gravel road, finds the need of shelter very much in the matter of orchards. The wind from the south-west blows hard fall and spring, when the ground is soft, and shakes the roots in the ground till they are quite loose. Has tried stakes and braces, but finds them ineffective and sometimes injurious unless carefully padded. Found rows of trees along the road on the south side, thirty-five feet high, keeps the snow level and the roads passable. Where there was no trees the road was blocked. Finds balsams not reliable; if they grow, they sometimes die in twelve years. With reference to the better class of evergreens, such as Norway spruce, he thought farmers must be assisted to purchase them or the movement would be very slow, as they come high.

Mr. DAY, Bayview—Evergreens do not grow well on this high ground, maple, elm and ash being better. While agreeing that shelter is valuable, yet has noticed that wind is more likely to prevent the midge, which works in the shelter of fences and sometimes trees.

Mr. BAKER, 12th line, gravel road, is of opinion that the most valuable thing connected with lines of trees is that they give shade to cattle. Observes that there is no shade so good as that of the butternut, which seems to have the property of keeping away insects, so that the cattle beneath it are not so much annoyed with flies. Mr. Baker observes that it is not so much what a beast eats which will benefit him, unless he also gets some quiet, shady place to lie and digest it in. Is in favour of one line of trees along the exposed part of his farm, also of much waste land being planted. States that many farms along certain lines here are being wasted away every year, as the bush has been cleared that should have held the rain, which now carries away all the good earth, till many of them are abandoned.

Mr. SHUNK, 12th line, considers there should be planted lines of trees along roads here in all parts. Much more of it should be done. In trying the Norway spruce, has planted fifty this spring about two feet high. These have been mulched with manure and are doing well. Mr. Shunk says this is a great point; he had a lot of trees in another place, and they were at a standstill, neither grew nor stopped. He mulched them in this manner and they took a start and went right ahead.

Mr. BURNETT, 12th line, finds the country much dried up since clearing. Had a good spring on an elevated piece of land, which gave water perpetually while the land was in bush, which is altogether dried up now it is cleared. Has some trees planted in the same spot round his house, for which he would not take any money, as the grove gives pleasant shelter. Thinks that some means, whether of planting the waste places on farms, or along roads, must be adopted, or if drying up proceeds as it has, there will be injury to all vegetation.

Mr. GIBBS, 12th line, considers the country is losing much by being denuded of trees. Showed us a beautiful piece of woods of his own, situated on a sharply sloping ground, which he is taking care of and means to keep. His neighbour has nearly cleared the same slope on his side, which will be of little benefit for crops, while he loses his bush. Mr. Gibbs considers the piece he has saved of great value to him as shelter, besides keeping a reserve of wood.

Mr. SNIDER, 12th line, believes lines of trees, especially along roads, do much good and no appreciable harm. Is planting trees himself, as fast as possible, but seasons are hurried and much cannot be done.

Mr. WATSON, 12th line, finds the greatest change, owing to the clearing of the forest, in the additional heat at night. Formerly a hot day brought a cool night, but lately the

nights also are hot. Has planted a good many maples ; thinks much more should be done in that way.

Mrs. BOWES, 11th line, finds the winds very much worse than formerly, and more destructive to orchards, but notices little changes in rainfall. Next to lines of trees the crops will be weaker for a rod. For wind-breaks, would plant along the roads. There is no perceptible injury caused by damp there, especially as in this part of the country there is little teaming done in fall and spring, the season when the trees might cause the roads to retain moisture.

Mrs. BOWES, side road, finds the orchards in great need of wind-breaks ; fruit is blown off in great quantities before ripening. When the first settlers cleared, if they had planted trees for shelter it would have been extremely valuable now, but they were too busy. Indeed, they are yet.

Mr. MARSHALL, 11th line, would rather have encouragement given to plant waste places on a farm, or on roads, than on any dividing line. A dividing line, of which his neighbour is to the south and he to the north, weakens his crops for a rod.

Mr. BURCHELL, 11th line, finds crops weaker for a rod each side of lines of trees between fields. Considers, however, that many farms are drying up and that the planting of trees is necessary. Would plant on roads and waste places of farms. Much dryer summers and springs since clearing.

Mr. BROOKS, 9th line, finds the climate totally changed by clearing, and the crops as well. For instance, formerly a new fallow when cleared would give a very good crop ; now not nearly so good a one, and full of thistles. Is not sure that lines of trees or plantations would give the old moisture back ; finds that under a line of trees for twenty feet there is a weaker crop ; but is still of opinion that there ought to be more trees preserved and grown, as it would add to the general fertility.

Mr. WAITE, 9th line, finds that since clearing the country is drying up, but can suggest no means of remedy more feasible than lines of trees along roads. This is valuable and should be carefully attended to. Where he was brought up the same had occurred ; and before he left there was neither the advantageous rainfall, or even the useful snow-fall which had been common where woods were more general.

Mr. LONG, 9th line, does not approve of trees on roads, as they keep them from drying. As for them near crops, saw no benefit in them, as near a tree the crop was poor. Had noticed no change in climate.

Mr. HOW, 9th line, finds that since the clearing up of the country, the rain, which was formerly general, now travels in lines, giving rains of perhaps a mile or two in breadth. So also with the wind ; it comes in violent and apparently narrow gales. Considers that the main chance of assisting matters by means of tree-planting is the encouragement of lines of trees along roads, where they are of great value. Would plant them to the west and south of all roads.

Mr. BRICE, 9th line, always finds trees weaken the crop under or close to them, yet thinks each farmer should maintain a grove. Trees are of great value to cattle.

Mr. ANNING, 9th line, does not like trees between fields, but considers that all roads would be the better of trees on each side. If turnpiked the roads would not be injured, while the shade would be a great benefit. The country much dryer since clearing.

Mr. McNAUGHTON, 9th line, has planted largely along the road. Does not agree with idea that proximity of woods hurts crops, for when woods were all around they had far better crops. What troubles principally now is the number of insects which were unknown formerly.

Mr. ROBSON, 9th line, has been here fifty-one years ; finds a great change in climate. Planting is valuable, but it is difficult to get those who have cleared the forest to re-plant ; still, many lines are being planted. What he would like to see would be lines of evergreens planted along exposed sides of farms. Maples, elms and poplars grow and look well, but against the cold winds of winter and spring are no protection. Evergreens are the things needed.

Mr. ELLIS, Nurseryman, 7th line, is much pleased by the impetus given to planting by the governmental reports and newspaper statements. Finds many more orders this year and last for evergreens than ever before. Has himself planted largely and finds the benefit. Considers the tall Lombardy poplars good wind-breaks, their height and rapid growth are both in their favour. Evergreens do well here. Came from Owen Sound in July; drew some black spruce out of a swamp in passing and covered the roots with damp moss; wetted them once or twice, planted them in twenty-four hours, and they all grew well.

Mr. HOFLAND, 7th line, has a very fine orchard, which only needs shelter, which he has partially given by poplars, and is planting many more. Planted lately 500 willows for a neighbour who likes them for shelter, but does not himself as they are apt to breed caterpillars. This will be the finest place for fruit in the country if only shelter by planting be given.

Mr. COX, 7th line—Here the mountain runs parallel with the lake, the water being north, leaving a strip of country varying in width at the base. The chief wind being south-west, Mr. Cox states that all is sheltered here; all Canadian crops and fruit grow well. We saw some fine trees heavily loaded with peaches, which mature well. Even a north wind from the water causes no storm, being checked in its course by the hill. Mr. Cox states that he and those on the level dwell in two climates; but that in his opinion, if they would plant rows of trees, they might be as sheltered as he.

Mr. DICE, 7th line, finds that just here, sheltered by hills and groves all round, is the best fruit country in Canada. In addition to the shelter, the lake on the north and east prevents spring frosts. There is no need at present to protect fruit trees here, so well does the present natural protection assist.

Mr. PATTERSON, 9th line. This is elevated land, above Cape Rich. There is great need of wind-breaks, the wind now blowing in a manner resembling streaks or lines across country, and often with great fury. A fourth of the roof of his barn was carried off last week. Crops can be grown close to woods on two sides without fear of rust or weakness.

Some portions of the land near here, an old resident remarks, was first settled, though it is so near the rock in part and of such hard red clay in other parts, that a number of the farms there had far better have been kept in forest. They have yielded some good crops in their days; but were not fit to last, and now are poor. If these, another old settler remarks, could be now got into good timber, it would be a most valuable work, and the best use they are fit for.

Mr. EMORY, gravel road, has long lines of tall stout Lombardy poplars on the road line, and rows of balsams protecting the sides. He finds these of great value. From the success of the experiment it is evident that along roads these would make a most valuable wind-break. They are only eighteen years old, and are sixty feet high and over eighteen inches through. They give no annoyance by suckers whatever. They are on the north side of the road.

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## CHAPTER III.

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### THE LUMBER REGIONS.

In all plans for improving our methods of forest management, which are frequently proposed, such as starting schools of forestry, introducing the scientific methods of Europe, and so on, one point has to be considered, that is, the systems of forestry in the Old and New World are totally distinct. In Europe, generally, lumber is felled or marked to be felled by the forest owners; the lumber merchant buys what is pointed out for sale.



Here, he purchases from the government of a state or province the right to take such trees as suit his purpose. There, it is generally the case that the peasant will clear the refuse for fuel, if not, it is used in manufactures, or cared for that it shall be no source of danger. Here, it is left to lie as chance throws it. This is and has been ever the case in all North America, as far as I have known or learned. The consequence has been the destruction of many fine pine forests in the United States, for fire follows the lumberman, who is forced by this method to still further wastefulness, for he cuts many young trees which would otherwise grow to large ones lest the fire take them off his hands. In Europe the forests, many of them, have been planted for the purpose, the trees stand as regularly as vegetables in a garden, and are sown, reared, and cut at stated intervals.

Immense damage has been done in Ontario, as elsewhere, by our American system, but in this Province of late years, measures have been taken to check it. A stringent Fire Act has been passed, demanding great care in the use of fire for camping and clearing purposes, and for the last two years a number of rangers, half paid by the government, half by the lumbermen, have traversed the country during the summer months to enforce it. They are employed on the application of lumbermen, who then become responsible for their share of the expense. These efforts, as will be seen by several communications following, are well spoken of. The plan is as yet not fully in operation, many lumbermen not having as yet applied for men, nevertheless, its success seems to have been considerable, for even through this last dry summer no fires at all so destructive as in former years have been reported.

Ontario has taken the lead in this matter. I do not know in America of such another Fire Act, nor of any body of rangers appointed to enforce one. Both have been favourably commented on in the Washington forestry reports, and their imitation pressed on the various state governments.

Though these steps will save much timber and far overpay their cost, yet we cannot say they will effectually preserve our forests. Time must tell. The next, if any further step be taken, must be the compulsory destruction of the refuse by the lumbermen. This is a matter for careful experiment, our climate being quite different from that of Europe, and even from that of Maine and Massachusetts. For these reasons I have recommended that this be tried on a Government reservation, where its possibility and cost can both be ascertained.

The next and final step, namely, the management, replanting, and care of Ontario forests on the European system, resolves itself into a question of expense. Such a vast reform—a reform unprecedented in America, could not be expected without the sacrifice of a very considerable portion of yearly revenue, fully, I should say, one-half of what we now draw from the forests. If the people of Ontario are willing to incur this, there is no reason why the object should not be attained. There are many reasons, climatic, as far as the present generation is concerned, economic, as regards their successors, to be urged in favour of such a course.

In this chapter will be sketched the condition and method adopted for dealing with the lumber regions of Ontario, showing which may be called the American, as differing from the European manner of lumbering and managing the territory where the merchantable timber is found.

These lands formerly included the whole Province, but the timber near the frontier being naturally the first exhausted, it may be said that in the Ontario peninsula west of Collingwood and Toronto, there is little left, and that in private hands. East of this line the lumber regions extend as far as Ottawa; and, passing up the Ottawa, westward, they extend along the north shore of Lake Huron (where are dense pine forests) to the Bruce Mines and Rainy River neighborhood, at the extreme west of the Province, where is still found much valuable timber. In fact, north of Lake Huron, there is very much which has never been lumbered over, though a great deal of this is overrun by fire.

The method of working these is by holding periodical sales of lumber districts, at which the highest bidder obtain the right to cut timber on certain portions, called limits, for a term which is renewable at the pleasure of the Government yearly, and practically is always renewed. On the timber cut the Government afterwards levy dues each year, in proportion to the amount cut. This, it will be seen, often gives the settler, if the land has been taken up for settlement, a joint interest in the lot with the lumberman, whose interest only extends to the timber.

The lumberman camps on the limit (if a large firm, he will have many camps, and central farms and depots). He cuts such of the trees as he chooses, takes what portion of the trunk suits him, cuts it into logs, leaves the tops and branches lying in the woods, and draws the logs on sledges to the nearest water, down which they are floated to the mills, if for boards; or if square timber, continue in raft to their chosen sea-port, generally Quebec. What is sent to the mills is generally for Canada or the States, the square timber is for Europe.

What has been commonly the method practised by lumbermen is to cut, as soon as possible, the merchantable timber from all portions of their limit which are nearest to settlement, or, in other words, in most danger from fire. They will often do this as far as they intend, in two or three cuttings, in successive years. They will then sell the right to cut to a smaller firm or jobber, who will glean what they have left. What portions they have in dense green forest, more distant from settlement, they leave till the last, or cut over it at long intervals. I was shown some which had been gone over but three times in twenty years.

I have procured during the last year, opinions from a great number of gentlemen, long resident in these districts and intimately acquainted with the lumber traffic, as to the present position of affairs. From various portions of the country the opinion was expressed that in fourteen or fifteen years the merchantable pine would be gone. In other parts, where forests had been, for various reasons, not so accessible, many years' cut still remained. But the same principle governed all, of which I am about to speak.

When a forest is lumbered over on the above plan, vast amounts of resinous tops, branches, and portions of trunks, as well as many young trees cut down to clear the way, are left lying in the forest. Then, the continual passage of campers, hunters, fishermen and lumbermen, causes the lighting of many fires; and in a dry season, these are likely to set fire to the refuse above-mentioned. This being highly inflammable, spreads the fire through the forest, and wide-spread conflagrations are often the result. This pine refuse is the great block in the way of good management of our pine forests, and many plans have been proposed for using or getting rid of it. Among the former it has been proposed to make wood oil from it, as is done in Sweden, and wood wool, as made there and in other parts of Europe; also, to use them for cattle-bedding. But there are reasons against these being the true definitions sought after.

In the first place, the cause of the use of forest refuse in Europe is simple and plain. The user cannot get the forest to use; that is in the hands of some great proprietor who will not have it cut down. Next, labor is cheap and plenty, and the refuse can be gathered without great cost, or, it may be, in some places at no cost, by allowing the peasants a share for firewood of what they collect. In Canada, were an oil factory or wood fibre factory started, its proprietors would probably find it much cheaper to buy four or five hundred acres with the forest but little touched, and to manufacture them, than they would, at our prices for labour and transport, be able to search over a large extent of forest for refuse.



It would, there is no doubt, be well that these experiments were tried here, since new industries which consume previously worthless products are always valuable. But as to the point in question, they could not solve it. Say the oil produced (it is a product not nearly as well known to the world as is the fibre) competed with our own petroleum to the extent of one-half, would the cost of half our petroleum collect and manufacture our lumber refuse? But a small part of it. Add what the wood fibre might give. Mattress and cushion filling would be its principal use, and for these purposes we now import the southern moss, which serves for the chief part of such work. Of this Canada imports about 200 tons. The wood fibre would scarcely displace more in these days of spring beds. That would take but little of our timber. I have seen as much burnt in one logging field.

The proposal to use pine refuse as litter for animals has been frequently made, but, in the first place, it could not be transported with sufficient cheapness to compete with straw, except, as in the case with our planing mills, in the cities where it is a waste product. In the next, it would not be well to use it largely for that purpose, as the pine refuse injures land, and therefore renders the manure on many soils inferior or worthless.

The state of affairs spoken of above is now, as stated, much changed for the better by the action of the Government, which, in combination with the lumbermen, have for the past two summers had a large number of fire rangers engaged in enforcing the Fire Act, long a dead letter, which demands extreme carefulness in setting out and extinguishing fires. I find from the above mentioned correspondence that this has, in many parts of the lumbering districts, had an excellent effect, as the following passages from letters received show.

One from Rainy River says: "Forest fires caused considerable damage some years ago, along the line of the Canadian Pacific Railway, but since the Ontario Government has put the Fire Act of 1878 in force there has not been much damage done."

One from Renfrew says: "Some fifteen or twenty years ago there were several miles in extent of valuable pine country almost totally destroyed by fire, which, if still intact it would be hard to estimate the value of; but since the Fire Act has been enforced and the assistance given by the limit holders, we had not many bad fires, and do not anticipate any serious losses from that source in future."

One from Addington says: "Regarding the question of forest fires, the lumbermen in this locality have nearly all taken advantage of the Order in Council appointing fire rangers: the system has given entire satisfaction, and the lumbermen are much pleased with the results. In many cases the rangers have prevented fires from spreading in the woods; and the fact of those men being employed has had a salutary effect upon settlers, hunters and others."

One from the County of Simcoe says: "The only lumbermen who have taken advantage of the Fire Act near here, by having fire rangers appointed, are the Longford Lumber Company, who, after two years' experience, express themselves as well pleased with the results. I am in hopes that other lumbermen will avail themselves of the very kind offer of the Government, and ask for the appointment of fire rangers, as I am quite satisfied it is a move in the right direction to prevent a great deal of damage by fire."

Another, speaking more particularly concerning the Lake Huron region, says: "I am informed that the lumbermen in this section mean to avail themselves this season of the privilege they have in appointing men to guard against fire. I know that fires are causing great destruction every season on the north shore of Lake Huron, where I have been more or less the last five summers, and each summer I can see the destruction that has been made. It would take up more of your time than you could well spare for me to give you the various causes and the remedies, but unless there is something done, the Province will lose a vast amount of revenue. There are miles upon miles of young and thrifty pine timber destroyed every season that could be protected by having a good man that knew the country thoroughly, and, let him have a few Indians and keep a vigilant look-out, there could be a great amount of valuable pine saved each year."

One from Peterboro' says: "Allow me to state that bush fires have not done much damage in this locality for the last year or two. The fire rangers visited this locality last

season, and I have no doubt that such officers do a great deal to prevent fires being set out. I would quite approve of such officers."

A letter from Peterboro', speaking of the difficult nature of the job, says: "I do not know any calling at present that would so soon make an old man of a young one as forest ranging; going alone and unaided, with only a small pack of provisions, for days in the forest, stopping wherever overtaken by night, exposed to all storms." He mentions that they are not always successful, as, "granted the ranger was on the ground half an hour after a fire breaks out, I do not think one man could accomplish anything towards putting it out, as the refuse through a chopping is so inflammable in a dry season. I think, though, that the fact of a Government official being in a timber locality has the effect with the people of making them more guarded and careful, during his stay anyway; at the same time, should a man, for some old grudge, make up his mind to burn a limit, forty-five rangers could neither stop nor detect him."

NOTE.—The statement by the writer that "if he were on the ground half an hour after," etc., does not give the full idea. I have repeatedly found fires burning a month after the campers had left, generally in maple logs or old roots. With a strong wind these may "break out" and set the forest on fire; but the ranger, guided by the smoke, can often see these and extinguish them before they spread, and can also institute enquiries as to who left the fire (an illegal act), and institute a prosecution. The knowledge that this is possible, as the above writer correctly remarks, tends to make people much more careful.

A letter from Peterborough makes the suggestive statement that "All the lumbermen have not availed themselves of the provisions of the Act; some of them have, and as far as I can learn, the results have been different, according as the parties were good men for the position or not."

Some good suggestions are made in the following letter from the Parry Sound district: "A great cause of the fire following the lumbermen's footsteps is from fire started by parties holding bad feelings against lumbermen or their agents for wrongs—real or imaginary. Where a trifling matter of frivolous nature arises between the lumberman and the settler, the wealthy and powerful one is apt to crush the poorer and weaker, and subsequent fires follow, destroying thousands of dollars' worth of valuable timber for a paltry misunderstanding regarding a few cents in the beginning. I think that the Amended Act of 1880, the settler holding a third interest in the timber after the patent is issued, will have some effect in keeping the fires from fallows more confined within the radius under clearing. I think that if Government would reduce the timber dues on dead or burnt pine, lumbermen could afford to cut a great deal of the dead pine to advantage before it became wormy and dosy. Say if the dues were reduced to fifteen to twenty-five cents per thousand b.m. I don't mean to say that the dues should be reduced on the pine burnt that season; that might lead to fires being started purposely to get the advantage of the reduced dues. But whenever there is a *brulé* or a dead pinery, such timber should be cut and the dues reduced from the ordinary dues collected on green pine."

Some letters received mention that the lumbermen in their districts have not yet secured the services of fire rangers, as offered by Government, but that they are expected to do so. A frequent cause of forest fires which should be especially guarded against is mentioned in a letter from Peterboro', concerning people who cut marsh hay. "I do not think the settlers are the cause of many of the bush fires that destroy so much of our valuable forests; in fact they are interested in fires not spreading, as they are in great danger of being burnt out themselves. The fires that have done most damage in this section are not from settlers clearing, but fires from camping parties and people who cut marsh hay. When everything becomes dry in summer they will set fire to the old grass in these marshes to clean the bottom and produce a better crop. These marshes being largely in the pine forest, the fire gets out into a large tract of timbered land, destroying wealth untold. I know whereof I speak in this matter. During my seventeen years' residence in this section I have frequently seen, at a great distance, large volumes of black smoke rise up. At once I have enquired where the large fire was, and invariably the answer was, 'O, it is in such a marsh; there is a lot of hay that was not cut last year

and some one is burning it.' It is true the marsh burns over, and so does the pine adjoining. The settlers get the blame, although in most cases there is not one within miles of where the fire started."

A suggestive statement comes from Pembroke: "Most of the pine forests of the Ottawa county would not be reproductive, as the pine there growing has come to maturity and is gradually decaying, to be replaced by other kinds of wood. Where the original trees were killed by fire, some twenty years past, the young pine is just commencing to appear, seeming to take that time to allow the nursery trees to grow and shelter them."

NOTE—These nursery trees mean generally small poplar. Underneath is a covering of weeds, which gives infant pines the shelter they need. If this be found general (and it might be assisted by sowing) there is hope of future forests. The statement of the pine coming to maturity means where pine forests are tall, dense, and all large trees. Small trees have little chance there; but where light is afforded by an opening, the young trees spring up. For instance, a letter, also from Pembroke, says: "Small pine, when thinned out by lumber operators, will grow quicker; the big pine being cut and taken away leaves more earth round the roots of the young pines to feed upon. It must be like all roots, the more you thin out vegetables the larger and faster they grow—the ones that are left."

The question having been asked whether persons found it possible to obtain land ostensibly for settlement, but really to take pine, bark, etc., for sale, and abandon the lots. About thirty answers state it impracticable, in their localities, to any extent, owing to the action of the regulations; but letters from Victoria, Renfrew, Hastings, Peterboro', Parry Sound, Muskoka and Algoma, state that it is yet to some extent carried on—sometimes for bark, sometimes for pine—the settler being allowed to sell what he cuts down in the course of clearing. Underbrushing has been interpreted to be the course of clearing, as it no doubt is, but the idea given is that the parties never intend to complete it, but leave when the pine is sold. For instance, a statement from Victoria is, "There are but few lots in this district bought from the Government ostensibly for settlement; but of those located under the Free Grant Act, I am sorry to say, that notwithstanding the fact that the locatee is required to take an oath that he intends the lot for the purpose of actual settlement and cultivation, too many of them have no real intention of settling upon them, but simply to cut and sell all the saleable timber, and the result is the forests are being destroyed by being cut and hacked through, and tops of trees left scattered round to be burned up, and the remaining standing timber killed by bush fires, the real settlement of the country being thereby greatly retarded."

Another letter says: "This is carried on in this district extensively, especially on Mississauga River and St. Joseph's Island. It is not too late yet to appoint a man to attend to this."

One from Peterboro' says: "In the great majority of cases I have met the 'settler,' or 'lumberman,' as he might more aptly be called, does not want a lot unless fairly well timbered, they claiming it is impossible for a poor man to go on a wild lot and live for the first few years, unless having the forest product to help them; and, in a great many cases, the lots are afterwards abandoned; and the bulk of them, in any case, are unfit to produce food for a man and family, consisting largely, so far as I have seen, of red granite."

As to the remedy for this, a letter from Renfrew giving an opinion in which several coincide, says: "My idea is, to prevent this, no lot of land should be sold before an actual inspection of the lot and the standing timber is made by the government forest ranger, and reported; also, he should report on the soil and its fitness for farming purposes; and I further think, for a great many reasons, the supervising wood ranger should be the land agent as well."

The situation throughout the lumber districts may be stated in this manner, so far as the method of cutting previously spoken of is concerned—that is, cutting all merchantable timber in exposed localities lest fire run through it. The fire rangers have been out but two seasons, and not in all localities, for a considerable number of lumbermen have not yet availed themselves of the offer of Government to pay half the cost, if the lumbermen apply for men. The lumbermen therefore, generally, are not in a position to judge whether their claims be now sufficiently secure to warrant them in leaving the small and



medium trees to grow to large timber. As soon as this is the case they will undoubtedly do it, for there is little profit in the small trees. But there is no doubt, even with the men now out, much good has been done, and the forests are immensely more secure. As soon as the rest of the lumbermen adopt the plan, which will be, I should judge, almost immediately, so ardently did many of them express themselves in its favour to myself, it is highly probable that an entirely different state of affairs will be inaugurated in our forests.

Without some security against fire, the lumberman has no inducement to preserve the forest. In good forest economy, he should leave his medium sized pines till they grow to be large, and then cut them. But if he did, in the intervening years, they were very liable to be swept off by fire, set by careless settlers, hunters, or by even his own men. There were—and are, it is feared—men even unprincipled enough to fire valuable pineries that they might get a little work in saving what pine could be secured from the wreck before the borers got it. All around him a lumberman's limits were insecure—what was a forest to-day might be a *brulé* in a fortnight. It was no wonder he too often took what he could, irrespective of growth. But, with a sufficient number of caretakers during the “fire months,” the cost of which is trifling, compared with the property saved, a different state of things will arise. The lumberman will be careful both to leave uncut what will pay him better in future years, and will endeavor so to use what refuse is useable or saleable, so that it shall not constitute a source of danger. Many expedients hitherto impossible will then be tried. There is much to be done, but in the appointment of fire rangers a great step in advance has been taken, and an important experiment attempted. As is very correctly stated in a quoted letter, the knowledge that such officials are on the ground will do much.

In forest as in ordinary police matters, it is not because the individual inclined to offend has himself been previously punished for offending, and therefore abstains from repeating the offence, that property remains tolerably secure. It is that some individuals are known to have been punished, and that the officers are known to be on the watch to detect others. It is not too much to say that in past years the Fire Act has been a dead letter. Lumbermen, settlers, hunters, fishers, set fires as they pleased and extinguished them if they chose, which last was seldom the case. The resultant damage was, as might be expected, immense. Fires smouldered in logs till drouth and high winds excited them to action, and there was no one to stay their ravages except the immediately interested lumbermen, who thus were always interested in “cutting clean” and leaving nothing, in which case the fire, when it followed, although it destroyed many thousand fine saplings, the hope of future forests, yet did not injure themselves, they having taken all which was saleable before. But now what may be expected is as follows:—

Word will, after a few convictions and punishments, go through all these districts, indeed through some it has already gone. The fisher, the hunter, the geologist (sometimes the worst of all, as our quoted extracts show) will be warned at the taverns where they stop. “You must mind your fires; so-and-so left theirs, and were tracked, summoned and fined.” For fire is a thing which leaves its plain traces, and if the rangers follow out the instructions carefully, affords every opportunity of proving the effects of their carelessness against those who misuse it. The effect will be that those who set fires at their camps will extinguish them (they are always near water), and that those settlers who burn fallows will notify their neighbors before doing so, and will take far greater pains to prevent the spread of the flames into the forest beyond their clearing.

A suggestion is made in a letter from Nipissing concerning the danger of pine rubbish left in the bush. He thinks that much of the evil is owing to part of the top of the tree containing one, or sometimes more, knotty but still merchantable logs, being left lying, the lower part of the tree being taken. He proposes that all logs so found should be charged dues, and says: “If lumbermen knew they were to pay a duty on that left, which competent men could easily prove and could not be gainsaid, there would be removed the very thing which causes bush fires; the top logs being resinous or pitch, and which would be considered valuable timber on the second or third cut, but it is useless

then as the worm has got into it. Perhaps the lumbermen may say they could not afford to pile the brush tops ; I say it will pay them."

A statement from Brudenell says :—" I think a very good way would be to have the whole tree taken out butt and top, and leave none to waste in the woods ; in this way much valuable timber would be saved to the country every year, and by cutting only the largest trees and leaving the smallest ones to grow for whatever number of years would be deemed advisable, I think lumbering could be prolonged to an indefinite period ; but on the outlying portions of timber berths and adjoining the settled parts of the country where there are patches of farming lands, it is hard to prevent squatters from going in on them, and would say that whatever pine may be in such places might as well be cut. Immigrants are coming in every year and want land."

A correspondent remarks that, on the north shore of Lake Huron, there are large groves of young, thrifty pine which need protection from fires.

A gentleman writing from the Parry Sound District states :—" There are thousands of acres of woodlands in these districts not suited either for grazing or farming which would be better left in the wild state of nature, than to be opened up for locatees who come in and locate on such lands and start to slash and burn what they think a farm, and subsequently learn by bitter experience that they have been toiling through ignorance, trying to make arable land out of barren rocks ; finally, in disgust, they pull up stakes, and leave acres of burnt rocks and dead timber behind them. If such sections of country were examined and exempted from location the danger of fire would be lessened, and the virgin forest would be left in its natural state."

An opinion from Nipissing was to the effect that :—" I think it would be advisable to put a price on land in townships where the pine is in large quantities, I think it would have the effect of stopping squatters from going in and settling in such townships until such time as the pine had been pretty well cut off."

As has before been noticed, Ontario is now trying throughout her lumber territories the experiment of stationing during the dry summer months a large number of fire rangers to enforce the Fire Act passed some years ago. This step was advised by many people throughout the Province long acquainted with lumbering operations, and its results are now being observed. There is no doubt whatever that this will save annually a large amount of valuable timber, and prevent many fires. The question now to be anxiously considered is, whether it will prevent them to such an extent as to give practical security to the lumberman in leaving the smaller pines to grow to a large size. It has been the practice hitherto in all outlying forests or those considered in danger of fire, to cut every tree from which a tolerable log could be taken, as there was very little likelihood that, if spared, the fire, which frequently followed the lumberman's operations in consequence of the quantity of refuse he leaves on the ground, would allow it to grow. It is to be hoped that the appointment of fire rangers will effect a total change in this.

This experiment is, as before remarked, in America, unique. The habit of the North American lumberman has ever been to cut the trees, leave the refuse, and risk the fire. Under this system, we may say, the northern States of the American Union have practically destroyed their pine forests. Having been in communication lately with officials of most of the States on the subject, I have not been informed of a single state maintaining any fire rangers whatever ; I have therefore great hopes from this experiment here. Without it the chances were that in from twelve to twenty years many of our present limits would be valueless for pine : with its aid the pine will last much longer than otherwise.



## CHAPTER IV.

## FOREST MANAGEMENT IN INDIA.

It is most important, in view of the fact that India is now making great advances in agriculture, and more especially in wheat growing, to notice that this capacity did not become apparent until after she had been for twenty-three years—ever since 1864—spending yearly vast sums of money in protecting her forests, and planting new ones with a view to climatic improvement. I give below a summary of the steps she has taken during late years, in this direction, compiled largely from the excellent treatise by J. Brown, Esq., LL.D., in the *Forester*. If Canada would follow the example of spending money in this manner, her sons, instead of seeking Manitoban wheat fields, might revive the almost forgotten glories of Canadian harvests.

By the way of illustration, I may mention two provinces, Assam and Burmah. The total area of Assam is 45,302 square miles. Of this area, a small portion only (6,750 square miles) is under cultivation. About 8,000 square miles are Government forests, but there is besides a very large extent of private forest. Thus, in the Goalpara district there are about 520 square miles of forest, the property of Zemindars, (large native landholders), while in the chief tea-producing districts of Cachar, Sibsagar and Lakhimpur, there are about 550 square miles of forest land in the hands of (principally) European tea-planters. For the other districts, no definite data regarding the area of private forests are available, and there are in addition to the forest, vast areas of grass land and waste, both private and the property of the Government. Of the forests in Assam at the disposal of the Government, the area actually demarcated and set apart as reserved forest, to be permanently maintained as such, is only 2,015 square miles. As far as plans have been formed, it is intended to increase the area of reserved forest to 3,000 square miles.

The total area of the province of British Burmah is 87,220 square miles, and of this area only 5,334 square miles are cultivated, the rest being forest and grass land, nearly the whole of which is at the disposal of the Government. According to present proposals, about 3,500 square miles will be demarcated and set apart as reserved forest, and of this the demarcation of 1,690 square miles has already been completed.

In the provinces under the Government of India, not including Mysore, which is now under its own native government, the area of reserved forests which have been demarcated and set apart to be permanently maintained as forest, aggregated 14,890 square miles on the 1st April, 1880. Outside these reserved forests, a certain control is exercised over a portion of the remaining forest area in these provinces; but the forest domains of the State, which it is intended permanently to maintain as forest, have the area which is stated above.

In the Bombay Presidency the area of reserved forests aggregated on the same day, 9,670 square miles. But here, as in the provinces under the Government of India, the work of demarcation has not been completed, and is still in full progress.

In the Madras Presidency the process of setting apart and demarcating the Government forests intended to be permanently maintained, has made less progress than in any of the other provinces. There are upwards of 16,000 acres of forest plantation (twenty-five square miles), and about 279 square miles of reserves under control of the Government, selected and demarcated in the vicinity of the lines of railway, chiefly for the purpose of furnishing a permanent supply of locomotive fuel.

In the provinces under the Government of India, the area under regular plantations aggregated 32,461 acres; but in addition to this, sowing and planting and other cultural operations are undertaken annually on large extents of forest, chiefly with the object of promoting

the growth of the more valuable species. In the Madras Presidency, as already mentioned, the area planted aggregates 16,000 acres, and this includes the well-known teak plantations of the Nilambur in the Malabar district, which cover an area of 3,500 acres, the oldest portions of which were planted in 1842, and are therefore now forty years old.

In the Bombay Presidency there are no very extensive plantations, but much has been done to facilitate the regeneration of forest, particularly on the dry hills of the Deccan, by strict protection and broadcast sowing. Similar measures have been taken with great success over large areas, aggregating 68,000 acres, in the babul forest of Sind, near the banks of the Indus.

The principal kinds of trees planted are chiefly those which have already been enumerated as those which are the most important.

In the hills of the North-west Himalaya, the deodar is the chief tree planted. In the plains of the Punjab, where wood is scarce, extensive plantations have been made of sissu. Thus, in the vicinity of Lahore, on the low, moist ground near the Ravi river, and at Changa Manga, on the high ground, with the aid of irrigation, extensive sissu forests, aggregating 14,000 acres, have been raised artificially, within the last twelve years, the older trees in which are now nearly thirty feet high. The wood produced in these plantations is sold as fire-wood, partly for locomotive fuel, partly for consumption at Lahore.

Teak is planted on a large scale in Burmah, and here a plan has been followed with great success, known under the name of *toungya* teak plantations. The Karens and other tribes which inhabit the hills of Burmah, practise a shifting kind of cultivation, by cutting and burning the forests, and raising one or two crops in the ashes.

On the clearances thus made, and together with the rice, which is the chief crop raised by these people, the teak seed is sown, and the result is a complete crop of that valuable tree, provided the bamboos, the coppice shoots of other trees, grasses and herbs are completely cleared; for this is the great difficulty in all planting and sowing operations in the moister and tropical parts of India, that the growth of bamboos and other trees is so luxuriant that the teak or other kinds planted gets choked. On the system of these *toungya* plantations, a total area of 2,515 acres had been planted up to the 1st April, 1880, at a cost, on an average, of 9-14 rupees, or about 16 shillings per acre; and the plantations on this system are now being extended annually on a large scale in the forests of British Burmah.

The excellent Nilambur teak plantations have already been mentioned. There are teak plantations on a smaller scale in North Kanara, on the banks of the Kalinardi, and in many other places within the range of that tree. And as an experiment, the tree has been planted outside the limits of its natural distribution, in Assam and in the Chittagong district of Bengal.

Sál produces so freely, naturally, that plantations of this tree are not, as a rule, required. By way of experiment, plantations have, however, been established, in order to stock open, grassy plains; and the best method has been found to put out plants from the forests. A peculiarity of the sál seed is that it germinates immediately after ripening, and that it loses its power of germinating very quickly. Hence, it is neither possible to keep the seed for any length of time, nor to send it any distance.

Extensive plantations of india-rubber have been made at Assam. In its natural state this tree generally germinates on the branches of old trees. At first these seedlings make very slow progress, but they commence to grow more rapidly as soon as some of the aerial roots thrown out by the young plant have reached the ground. The young india-rubber plants require a great deal of light, which it finds more on the branches of trees than on the ground under the shade of the forest. Self-sown seedlings on the ground are only found in open places where there is an abundance of light.

Experiments were made to imitate the natural reproduction of the tree, and to sow the seeds in the forks and branches of the trees; but this process was found to be so extremely slow that it was abandoned, and broad lines were cleared, instead, through the forest, and the seedlings were planted out on raised mounds of earth. This plan has succeeded admirably, and several hundred acres have now been planted on this system.

The lines are 100 feet apart, and the distance between the plants within the lines is 25 feet. These great distances are necessary, as the India rubber fig is an exceedingly

spreading tree, which, at the distances named, may be expected to take up the greater part of the ground.

As regards the establishment of nurseries, it may be said that the general rule is to sow the seed as much as possible in their permanent sites, but that nurseries are always established simultaneously with these sowings, with the view of filling up blanks by planting out from these nurseries. In the case of some trees, such as India rubber, no sowing in the permanent sites is possible.

As regards the distances at which young trees are planted out, this necessarily varies, according to the kind of trees planted and the circumstances of the case. But it will be well to mention here that in many cases the plan of sowing or planting in lines has been found to answer best. The lines are, according to circumstances, ten, twenty, or thirty feet apart, and the distance between plants or seed plots is much less. The main object of this system is to facilitate control and to diminish expense. The system of planting and sowing in lines is particularly useful where the growth of grass, weeds, coppice-shoots, and bamboos is so heavy that the plants require cleaning during a series of years to prevent their being choked. Under such conditions it is more economical to clear the jungle only along certain well defined lines, and at the same time, as the plants grow up closely within the lines; they are soon enabled to cover the ground and draw each other up; while the elbow-room given them on either side enables the naturally stronger or more favoured plants to get the upper hand over their weaker neighbours. Thus the process of natural selection is promoted, the expense of clearing is diminished, and control is facilitated. The plan has a further advantage in India, where in most cases the thinnings of plantations are unsaleable, that, the lines being far apart, it takes a long time before the trees close overhead laterally, and before thinnings become necessary.

As regards forest trees, the most important introductions have been made from Australia. Forests, raised by planting within the last thirty years of the *Eucalyptus globulus*, or blue gum, cover large areas on the Nilgris, and several species of *Acacia* also, have been extensively planted. Other species of *Eucalyptus* have been found to thrive on the plains of North India and in some places of the North-west Himalayas.

A peculiar feature in most Indian forests is that they do not, like the Scotch fir forests of the Highlands, the beech forests of Buckinghamshire, and like most forests of Europe, consist of one or a few kinds of trees only, but that they are mixed, consisting of a great variety of trees, of which generally the majority are worthless, a few kinds only being valuable.

Thus teak is associated with a large number of other trees in the forests of Burmah or South India, and most of its companions have no (or very little) value, and cannot be utilized. This peculiar feature of the mixed forests of India renders their systematic management and working extremely difficult, and every effort is made to increase the proportion of the more valuable kinds, and to devise means for utilizing those which are of less value.

Bamboos are commonly found in many Indian forests; but while in some forests they are valuable, and can readily be disposed of, they are without any value in others; and in such places they are at a disadvantage, as they impede the development of the more valuable trees.

The demand for firewood and charcoal is limited in most parts of India. Dried cow-dung is used for fuel on a very large scale, and it would be a most important and advantageous measure to increase the use of firewood, and thus to stimulate the use of manure for its legitimate purpose. But even if the whole of the people took to using firewood for cooking, sugar-boiling and other purposes for which cow-dung is used at present in many parts of India, the demand for firewood would not be sufficient to utilize the entire mass of the less valuable woods which are the companions of teak and other valuable kinds of trees in the Indian forests.

Hence it has become necessary to devise other means for utilizing the great mass of the less valuable woods. For this purpose it has been proposed to revive and extend the old native charcoal-iron industry, and to impregnate such woods with antiseptic substances, so as to make them more durable, and hence more readily saleable. At present the difficulty remains in many forests of India that there is no demand whatever for any



except a few valuable kinds of timber ; and that as these are cut out, the less valuable kind take their places, unless much outlay is incurred in sowing and planting.

These are some of the peculiar conditions under which forestry is practised in India. Now as to the outlines of the system followed, and the present condition of the forests. The first step has been to select from the waste and forest lands which were at the disposal of the Government, certain areas most suitable to be permanently maintained as forest, to place them under efficient protection, and to improve them steadily, so as to increase the proportion of the more valuable kind of trees.

The first and most important step which requires to be taken in improving these forests is to exclude fires, which throughout the greater part of India, were formerly a regularly and annually recurring event during the dry season. The chief cause of these annual forest fires is the universal practice of setting fire to the dry grass and leaves in the hot season, the object being to produce a crop of fresh green grass for the cattle, to facilitate shooting and hunting, or to afford protection against wild animals. In many cases these fires are caused by the burning of forest cut down for toungya cultivation, or by mere carelessness.

It has already been stated that the total area of demarcated forests in British India, excluding Madras and Bombay, amounted to 14,890 square miles on the 1st of April, 1880. Of this area 795 square miles are in the Punjab where, though fires do occur, and are often very destructive, they are not a regular annual institution, and where, as a rule, no special measures are taken to guard against them. Of the forests in the remaining provinces (14,895 square miles) an aggregate area of 3,700 square miles was protected during the hot season of 1880, and a large portion of this area has been protected for several years previously. This result has not been accomplished without great labor and considerable expense, in clearing and burning lines round the portions protected, and in entertaining special guards and watchers. During 1879-80 the outlay on this work amounted to 70,000 rupees. Nor has the progress made in this work been uniform in all provinces. Thus, while in the central provinces nearly one-half of the forest area is under protection from fire, a small proportion only of the total area is protected in Burma.

Eventually it is intended to bring the greater portion of the permanent forest area under protection ; and this is necessary, for these fires injure the standing trees of all ages, destroy seed and seedlings, and cause the soil to deteriorate.

Systematic efforts to exclude fires from forests have been confined to the provinces under the Government of India, although in some districts of the Bombay Presidency, particularly in North Kanara, considerable success has been attained in this respect.

Next in importance to fire protection are plantations, which have been mentioned already ; but it is obvious that no planting operations can be of any value unless the ground on which they are made is protected from fire. It will now be understood that the production of young growth, to replace the trees when cut down, is secured partly naturally by self-sown seedlings, for which purpose protection from fire is essential, partly artificially by planting, with the special object of increasing the proportion of the more valuable kinds in the forest.

The surplus revenue yielded to the state by the management of these forests is not as yet very large. The reason of this is that cuttings are restricted to the utmost, and that attention is chiefly devoted to the formation and improvement of these forest estates. Yet the revenue yielded by these estates is increasing steadily, though the charges for protection and improvement have necessarily risen in a larger proportion.

A word should now be said regarding the establishments employed for the protection and management of these forests. The chief forest officer in each province or sub-division of a province is styled "Conservator of Forests."

The circuit under his control is sub-divided into a number of divisions, each division forming the charge of a superior officer, generally a Deputy or Assistant Conservator. Divisions are sub-divided into ranges or executive forest charges. Ranges are the most important unit in the whole organization. Their extent varies exceedingly, but it is probable that eventually an average area of about thirty square miles, or 20,000 acres, will be found to be the most convenient size for these executive charges. In the provinces under the Government of India it has already been stated that the area demarcated

to be permanently maintained as forest, amounts to about 15,000 square miles, and it is probable that this area will be increased to 20,000 square miles. Under these circumstances it may be assumed that eventually there will be about 660 executive charges or forest ranges in these provinces. It is intended that when the organization has been completely worked out, ranges shall be held either by rangers or by junior officers of the superior staff.

All rangers are and will be natives, so that the filling of these appointments will require the training of an efficient body of at least 600 native officers, all well educated and competent to hold executive charge of a forest range.

For the purpose of training this body of men, a forest school has lately been established at Dehra Dun, in the North-Western provinces, and the arrangement is that eight months in the year are devoted to practical training, while the remaining four months, during the slack season in summer, are devoted to theoretical instruction in mathematics, the natural sciences and forestry.

At present the number of rangers is only ninety seven, and hence ranges are frequently in charge of subordinate officers. On the successful training of the needful number of rangers will mainly depend the success of the forest administration in India, and the strength of the Forest Department will chiefly lie in the formation of an efficient body of executive officers and forest rangers.

It is here the place to say a few words regarding the arrangements made for the professional education of the officers who are destined for the superior staff of Conservators, Deputy and Assistant Conservators—in fact, of the officers in charge of circles and divisions.

As the organization of forest administration is perfected, all these officers, excepting some of the junior men, who must commence their practical career as executive officers in charge of forest ranges, will be controlling, inspecting and directing officers. The number of these appointments will therefore be limited. It is at present ninety-three, and is not likely to be increased beyond one hundred for the provinces under the Government of India.

Obviously these are most important and responsible posts; the men must be gentlemen, and they must have such a good general education as will fit them for high administration duties. Under existing arrangements, this superior class of officers is recruited by the appointment annually of a few young Englishmen, who are selected by the Secretary of State in India, on the ground of an examination in mathematics, natural sciences, and the branches of knowledge, and after going through a course of professional training in the state forests of the continent of Europe, chiefly in those of France. Here they learn the method adopted for administering large Government forest domains; they become familiar with the organization of a large public forest service; and among other professional matters of importance, they learn to appreciate the success attained by the system of natural reproduction.

From the commencement great care has been taken to maintain an intimate connection between forest administration in India, and in those countries of Europe where large areas of state and communal forests are managed according to a regular system. In building up the system of forest administration in India, we have thus utilized the experience gained in those countries by the work of centuries, instead of following the ideas and theories of individual men. The formation of the Government forest domains in India, and the organization of their management, has been a large undertaking, and whatever success has been attained in this matter is due entirely to our having utilized the experience gained in forest administration in Europe.

As far as matters have gone, the chief work in forest conservancy in India has been done by the British Government. Attempts have, however, been made by the governments of several native states to protect their forests efficiently, and to manage them on a regular system. Thus, a regular Forest Department has been established in the Nizam's dominions, in the States of Patiala and Sirmur in the Punjab, and in other native states. Some of the chiefs of the Hill States, near Simla, have entirely and successfully prohibited the annual firing, during the dry season, of the grass and forest lands in their territories, and others have established extensive forest preserves.



## U. S. FORESTRY.

As what is done in the matter of forestry of the United States is of great interest to us in Canada, we quote the statement of the U. S. Commissioner of Agriculture with reference to the forestry branch at Washington. It will be seen that he recommends experiments on military reservations. Here, they are recommended on forest reservations to be set apart by the Government. Practically, what he asks is much more money to be spent in forest preservation. That spent in educating public opinion has, he says, done good service, but he asks that other and larger sums be spent in practical work:—

“I desire again to refer in strong terms to the urgent needs of the country for a changed forest policy and the requirements of the Department for a proper prosecution of needful investigations into the subject of forestry. While I have made only the usual estimate of \$10,000 for the continuance of the division, I consider this amount below the actual requirements for a line of work which, if it is to be done at all under Government control, recommendation or advice, should be pursued in a manner adequate to its importance to the nation at large.

“While, from the experience of the Old World, we may learn the effects of recklessness and waste, and the necessity for a rational forest policy, yet with our different system of land holding we cannot expect to adopt their plans of administration. While from European forest management we may learn the principles underlying forest growth and forest management in general, with our different forest, flora, and different climatic conditions, we shall have to work out our own system of management. This requires painstaking and systematic study, and inquiry at the hands of experts conversant with forestry principles and forest conditions. The Department should be placed in position to employ and pay liberally the very best talent on these subjects which the country affords.

“Regarded simply from a business point of view, the forestry problem is growing every year in importance and urgency, as the forest area is diminished by both legitimate and reckless denudation, and it should be an object of serious concern to the Government to insure continuity of supply of raw material to a lumber industry representing a capital invested of not less than \$200,000,000, not to speak of the many minor necessities of a wood supply for railroad building, manufactures and domestic purposes. Figures are at hand to prove that this supply must be waning.

“Practically there is in the United States no forest reproduction attempted or forest planting done worth mentioning, in comparison with the enormous annual consumption of forest products.

“Of still more momentous bearing upon the welfare of the country are the effects upon climatic and agricultural conditions caused by improper deforestation.

“The influence of the forest cover on water supply has become especially noticeable in those districts, which like Eastern Colorado and Southern California, are dependent for their agricultural success upon irrigation, and where a diminution and irregularity of the wonted water supply has gone hand in hand with the havoc and desolation wrought in the mountains adjoining by reckless denudation.

“While, through publications from this Department and other sources, through agitation and discussion by societies and newspapers, a better knowledge of the condition of our forests have been gained, and through representations of the experience of older nations the importance of the subject of forestry and the dangers resulting from its neglect are appreciated by a larger number of people than formerly, yet it cannot be said that we have come very much nearer to a practical solution of the problem. Meanwhile the difficulties in its solution are increasing as time goes on.

“As a first step of reform undoubtedly the land policy of the United States, in the timbered regions, requires a change according to the changed condition of those localities. A state of affairs which allows railroad companies, miners, prospectors and settlers to cut

timber on the public domain as their wants require, without any proper supervision, without proper opportunity of acquiring either material or timber land by purchase, holds out a premium for fraud, theft and immorality. The inadequacy of the force to prevent depredations and to enforce existing laws is productive of the most reckless devastation of these mountain forests, while the value of timber destroyed by fire in one year in Colorado alone would suffice to pay a force of a thousand forest guards.

"Besides the good example which the Government may set in taking better care of its own timber lands, it might appropriately extend its operations, by planting on a large scale, in bodies of several contiguous sections, in the treeless states and territories of the west.

"The military reservations in those states, owned by the General Government, would form a most desirable field of operation. Only by such extensive planting can a desirable modification of the extremes of climate on the western plains be expected.

"If, as seems contemplated by Congress, the so-called timber-culture Act should be repealed, I would suggest that this be not done without in some way making proper provision for timber planting on homestead entries. More good is to be expected from such planting, where the owner is near at hand to watch and give needed cultivation, than in the case of timber-claim planting, which to a large extent has been practiced, it is alleged, for mere speculative purposes.

"To bring the educational institutions into sympathy with the forestry movement, and to interest them in forestry matters, the public school organizations of several states have been invited to co-operate in gathering the forestry statistics of their localities, and schedules for phenological observations have been distributed among the agricultural colleges and several thousand private observers.

"The liability of tree seeds to deteriorate when kept and the difficulty of handling most of them by inexperienced planters makes this manner of supplying material a doubtful aid to tree planters. The distribution of seedlings, on the other hand, requires a more systematic and organized arrangement than the present funds of the division will allow.

"Both the requirements of experimentation and aid by supply of material, as well as instruction in the art of forest planting and management, could be admirably complied with in connection with such plantations by the General Government as heretofore suggested.

"Several states, notably New York, Ohio, Colorado and California, recognizing the value of their forests, have instituted commissions or boards of forestry, with a view of at least protecting what remains from useless destruction. Besides the National Forestry Congress, which continues in its deserving missionary work, several state forestry associations are endeavouring to create a public sentiment in the interest of forest preservation. These endeavours are worthy of encouragement, and this Department should be authorized in its discretion to extend aid to such boards of forestry and societies by the publication of their proceedings, or in other ways.

"With the increasing interest in forestry the correspondence of a technical character is constantly growing, and this work of giving information and advice alone consumes a considerable amount of time, and requires better office facilities than it has been possible to provide without curtailing other work.

"It will appear from these statements that the work of this division ought to grow in importance as well as in scope; but that in order to do the work required for a country with such a vast area, such a great diversity of soil, climate and conditions, such immense variety of forest flora, more adequate means must be provided if it is to be more reliable, more exhaustive, and of more practical value, or a direct benefit to our people. If forethought is the root of statesmanship, here indeed is a worthy field for its exercise; for the interests of forestry lie in the future rather than in the present. It is for future generations rather than our own that we must be wise in dealing with this problem, and the time for dealing with it is now, when favourable conditions are not yet entirely lost, and while it is still possible to avoid the disastrous effects of a policy of unconcern."

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 WASHING AWAY OF THE LAND FOR WANT OF FORESTS.
 

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What is especially noticeable in Ontario since our forests near the front have been largely cleared, is the quantity of valuable and fertile soil washed away into the streams. In a valuable communication sent by Joaquin Miller to the Forestry Congress, which met last month at Springfield, Illinois, the following occurs:—

"I believe it is pretty generally conceded that our continent is being washed into the sea by way of the Mississippi and its thousands of miles of tributaries on the one hand, and at the same time swept naked of its native forests by annual fires on the other. I take it that it is this deplorable condition of things that has called into existence the American Congress of Forestry. I spent some time with the late Capt. Eads at the mouth of the Father of Waters, inspecting his jetties, two years ago.

"We have begun at the wrong end," said this great man more than once to me.

"One morning he threw a bucket over the side of the boat and drew up several gallons of dark mud and water.

"There," cried the great engineer, 'there is a mixture of one-tenth Missouri, one-tenth Illinois, one-tenth Iowa, one fraction Kentucky, and so on, through about fifteen states, with an addition of about five-tenths of pure water.'

"And what would you do, Capt. Eads, to stop this washing away of states?"

"As I told you," remarked the energetic old man, as he dumped the ugly mixture back into the Gulf of Mexico, 'we have begun at the wrong end. But the country is not educated up to the point of beginning. It wants the other end for wheat and corn. It only wants the mouth of the river kept open so as to be able to sell its corn for the present generation, and let the next generation look out for itself. The other end of the river has drowned out this end; state after state is going to be drowned out until some day the coral insect may again build his pretty castles where the people of Iowa are now digging wells for water. The United States is tearing out her very heart with her gang-plows, and dumping it into the sea, sir.'

"I beg to put this statement before the country with something of the emphasis with which this great and good man uttered it there in the mouth of the great river. More than once he brought up the subject and always with an emphasis that would write every syllable in italics.

"Capt. Eads was very fond of quoting poetry. Once he was saying to himself, 'Leaves, leaves, nothing but leaves,' when he suddenly turned to me and said: 'Do you know that in leaves you can read the history of creation? My son, leaves are not only creation, but salvation.' Capt. Eads explained to me that he meant if leaves and grasses were left lying on the ground at the proper time of the year, as nature, the hand of God, placed them, there would never be any damage from high water any time; that leaves would be the salvation of the republic, and that there would never be any need for Eads' jetties. He explained that he meant when he said that leaves were creation that there is no nourishment so dear to the hungry earth as a handful of leaves. He insisted that more beauty could be grown out of a single basket of leaves than a whole load of manure.

"Well, let me tell you right here that if this process of fires and floods—floods that always follow fires—is permitted to go on by the help of 10,000 iron-toothed mills—gang-plows in the valleys to help along the flood that has gathered force in the burned-out higher land—why, we will accomplish the same desolation just as certain as water runs; only we will achieve by the aid of gang-plow and circular-saw implements, unknown of old, in two centuries what it took Babylon twenty to bring about."



## FOREST CULTIVATION FOR PROFIT.

The following valuable statement is taken from the address of the Hon. Martin Conrad, of Chicago, at Springfield, last month :—

"In ever-widening circles does this destruction spread over the land. It is but a few years ago that Chicago drew the bulk of its whitewood supply from the state of Michigan—while to-day, that great timber state, in common with ourselves, draws upon Tennessee and other southern districts for this valuable wood. Oak, at that time, was so abundant that it could not be profitably shipped by rail to Chicago from outside a radius of a hundred miles ; whereas, to-day, Arkansas and even Mississippi are represented in the oak supply of the Chicago yards. Black-walnut and live-oak are already practically extinct ; but long before the culmination of this ominous result—even as far back as 1868—The Hon. T. M. Edmunds in his report to the U. S. Department of Agriculture, foresaw a complete extinction of all timber resources of the United States in about fifty years. This threatened loss alone should demand prompt measures of restraint ; but the disasters that we invite, through the climatic changes that must follow our imprudence, are appalling enough to justify the gravest fear.

"It is not my purpose to introduce here any lurid pictures of calamities in store for us—as better pens than mine, guided by the hands of science have already enlightened us as to the probable course of events if the present conditions are allowed to continue. The note of alarm has been sounded long ago, and the stormy floods of the Mississippi and the Ohio have re-echoed it with terrific emphasis.

"In proof of the enormous climatic changes that can result from such a cause, I may mention that we have an actual demonstration of the whole process at our very doors. I refer to the northern domain of our sister republic of Mexico, a section whose former luxuriance of vegetation once proclaimed it a paradise, and whose mineral wealth marked a brilliant page in the chronicles of the sixteenth century. This region is to-day a parched and torrid desert land, treeless and waterless, in whose barren solitudes it would seem that few would have dared to venture.

"Yet it is a deeply significant fact that these sunburnt valleys, not only around the city of Chihuahua, but also in many other parts of that section, should be covered with acre after acre of slag from silver ore. It must be borne in mind that in all this strange region there is not a bed of coal and that, therefore, the extensive smelting operations that are evidenced by the vast fields of slag, must have required an enormous and also convenient, supply of wood for fuel. It follows then that at some distant period of the past dense forests must have covered this land, and furnished the necessary fuel, thereby completely verifying the statement of Bernal Diaz, the soldier-historian of the Cortez expedition, that they found the region covered with luxuriant woods, verdant valleys and fertile plateaus. It was the treasure hunters then who followed these conquerors that inaugurated the destruction which has extinguished these forests and swept all vegetation from the face of the land.

"With nature's sheltering mantle thus removed, the denuded earth quickly yielded to the influence of an already arid climate, and the desert promptly spread over the area thus prepared for it. The noble forests have vanished at the touch of civilization, and with them also, the life-giving interchange of the clouds and the dew—the balance-wheel of nature's fertility. To-day only a few scattered ruins, here and there, in the midst of lonely wastes of desert, are left, to speak of their former beauty and grandeur. Could the explorer Cortez, and his devout historian, at this moment look upon those beautiful valleys of 350 years ago, viewing again the scenes of their adventures and discoveries, their pious catholicism might be charmed by the sight of the grand cathedral, with its stately towers, costing almost a round million of dollars, as well as the beautiful park at its doors, with its fountains, trees and luxuriance of tropical plants, maintained in this splendor, by the ever watchful, artificial care of man ; but, looking beyond this little garden spot, they would search in vain for the Eden of primeval beauty that first met their wondering gaze, for their eyes would rest only upon the dreary desolation and ruin which their treasure-seeking followers left behind them.

"Fortunately, we have a prudent example before us, in the countries of Europe, in all of which the forests are under government guardianship, protecting them against fire as well as spoliation; and, however little we may profit by this (for such a system would be a physical impossibility in this country), it may at least serve to remind us that our national legislation tends to the opposite direction, and that at least indirect relief could be afforded by admitting foreign lumber free, and thereby lessening that much of the drain upon our own resources.

"Without stopping to discuss this point, it is worth while to see what can be done legitimately in the right direction, and to inquire if there is not a chance of redeeming the situation by intelligent and well directed individual action, with a sufficient incentive of personal profit to warrant hopes of success. If I can show that proper efforts in tree culture will prove profitable and that it is a sure and valuable investment for any farmer and land owner, this may be the means of forestalling evil results and recovering some part of what has been so wantonly destroyed."

To bring forth adequate results, therefore, will, as I have said, require the powerful stimulus of personal gain to whomsoever shall venture his means and his time in this beneficent work. I am aware that it is the unfortunate, though general impression that no profit can possibly accrue to an investment that waits for a forest to grow up from the seed, yet I propose to show that nothing could be further from the reality. I maintain that there is a profit in it, and that a well-directed system of cultivation will not only repay the investment richly at an early period, but will be the means of solving the economic problem of our timber supply.

Any line of inquiry looking to the practical solution of this great problem must naturally begin with the number of trees can be successfully grown on a given space of land—say an acre—for a unit of calculation; but, simple as the question may seem, it is vain to look for it in books. One German authority gives us 300 to 400 trees to an acre, as the results of an 80-year period of cultivation; but unless we are ready to allow a good deal for the rigorous thoroughness of the forestry systems of the old country, we may be pardoned for doubting these figures. We must reflect that a square rod to each matured tree is a small enough allowance of ground space for a large healthy growth. This gives us 160 trees to an acre, but to be still more conservative, let us knock off fifty more, leaving 110 trees to the acre for the harvest eighty years after planting the seed. This result coincides exactly with the figures given by A. R. Whitney, Esq., the veteran tree grower and proprietor of the well-known Whitney nurseries at Franklin Grove, Ill.

The long practical experience of this gentleman has formulated the following method of cultivation, viz. :—

Starting with a planting of 2,720 young trees to the acre, set four feet apart, he begins by trimming out after ten years of growth every other north and south row. Five years later every alternate tree in each of the remaining rows is removed, and after another interval of five years more, cull out all imperfect growths, which will leave an average of not less than 110 trees to the acre.

To put this result in marketable form is the next step in our inquiry, that we may determine the money value of our harvest. Our leading hardwood lumbermen count an average of two trees for each 1,000 feet of lumber, and with these factors we may easily compile the following table, showing the value per acre of our 80-year crop of cultivated trees.

#### VALUE OF ACRE OF TIMBER OF EIGHTY YEARS' GROWTH.

Number of trees per acre .....	110
Number of trees to cut 1,000 feet .....	2
Number of feet of lumber per acre .....	55,000
Price per 1,000 feet .....	\$18 00
Value per acre, 80 years' growth .....	\$1,100 00
Average value per acre per year .....	\$12 37½



Is not this encouraging result worthy of earnest consideration by every farmer and land-owner? A little further reflection will show him that the above result is safely within the reality, as such lumber as we speak of will be worth at least \$50 per 1,000 feet eighty years hence, and he may also count upon the yearly trimmings of trees, which increase in value, growing from poles to trees that will make the very best second growth spokes, and carriage stock, as well as all kinds of the most expensive axe, hammer, and pick handles. For these purposes, a tree at thirty to forty years is of greater value than when fully matured. Besides this, we will have timber which will be useful for fuel, fencing or charcoal, and will eventually afford a steady revenue far beyond the actual cost of supervision and labour; and in addition to all this, we must bear in mind that the timber left over after the logs are cut, including the tanbark, is very nearly as valuable as the logs themselves. But you may say that a period of eighty years—aye, forty years—is a long time to await the fruits of your labour. True, but cannot its full value be realized just as readily as any of the other permanent improvements on your lands? Your investment in the tree-plantation is not locked up, for should you sell the place at any time, it will certainly take rank with the rest of the improvements as an element of value, and will bring its full price.

No other improvement on your estate can do more than this. The soil itself is certainly not as productive as it was when you first turned the virgin sod, while neither the well-appointed farm-house nor the roomy barn nor any of the other fixtures can ever realize you a cent, except as part and parcel of the whole, and then only when it passes out of your possession by outright sale. It is the sum of all these improvements that enables you to value the property at twenty times its original cost, and not because the land will produce more than it did in the past.

Your investment in the tree plantation must therefore be ranked with the permanent improvements of the place, with the additional certainty that at whatever period of its growth a transfer of ownership may take place it will invariably yield its full value; for while all the rest are undergoing the process of natural decay and require constant labor and expense to keep them in repair, the value of the tree farm until it matures is steadily accumulating with the years, and it must therefore in its intrinsic worth prove the most valuable of all the improvements on your estate.

My subject having been limited to only such woods of natural forest growth as are in present use for waggon making, I must mention that there are numerous varieties maturing at least a decade of years earlier than are possibly better adapted to our soil, which might be substituted in many branches of manufacture without affecting the quality of the article. However, as I have based my estimate of profit upon the oak, which of all species requires the longest time to attain maturity, it follows without argument that with trees of an earlier maturity the average would be proportionally larger.

Having therefore clearly shown that the culture of timber implies nothing in the nature of sacrifice, but on the contrary is a valuable source of revenue, it follows that the great problem can be solved by the incentives which nature herself holds out. She asks nothing without recompense, but offers a far more substantial reward than the mere consciousness of duty performed. Had the proprietors of the Schuttler Wagon Factory planted an oak for each one they cut down for spoke timber since the establishment of their works in 1843, they might to-day make a like amount of second growth spokes from the same ground.

And before going further, let me say that this latter fact has actually been verified in a most interesting and noteworthy manner. The factory named has just finished a wagon built entirely of cultivated Illinois timber, twenty varieties of which enter into its construction,—none of them over forty years' growth from the seed. This great variety was sought, only to show what it is possible to produce on our prairie soil, and not for lack of material,—for the entire running-gear could have been made out of one honey locust log in the lot, which measured eighteen inches clear in diameter. The entire assortment of woods was furnished by Mr. A. R. Whitney, of Franklin Grove, of whom mention has already been made.

## RUSSIAN FORESTRY EXPERIENCE.

A statement made by Professor Budd, of the Iowa Board of Forestry, at the late Forestry Congress, gives a very remarkable and convincing piece of evidence. He says:—

"During the summer of 1882 I was permitted to study critically the elaborate forestry system of the Russian Empire in Europe. Prior to the time of Peter the Great we have the most complete evidence that a very large part of the black soil region east of the Volga was subject to periodic extremes of rainfall, followed by long continued drouth, during which the moisture-bearing winds from the west passed over the heated plains of Russia in Europe and Central Asia to the far off Altia range of mountains without precipitation, as they now pass over Western Texas and Southern California. Now, the planted forests on these steppes are 12,502 in number, which are under the general supervision of 762 educated directors.

"The area of these individual forests ranges from 3,000 to 30,000 acres.

"In company with forestry experts we passed through many of these island forests on the great plain, and found everywhere an attempt to preserve *real forestry conditions* by thickness of planting, the preservation of underbrush in open parts, and the rigid exclusion of fires and stock. In all cases we found the dense sylvan shades, and the carpeting of leaves and leaf mould which keep the earth cool and moist.

"As to climatic effects, the minister of public domain assured us that the meteorological records of past 150 years, and the reported crop yields on the steppes dotted with these forests, had shown a cumulative increase of rainfall from summer showers, and a decided increase in the moisture of the air during the growing season.

"He was also positive in the statement that the modifying influence had extended into the eastern sections, with the completion of the forests, where formerly the lands had been utterly worthless except for thin and scanty pasturage.

"In the earlier history of this region the main rainfalls were in June, but since the completion of the forestry system—now covering fully 30 per cent. of the black soil area—the summer showers during July and August permit the successful culture of the sugar beet, potatoes, Indian corn and other crops requiring rainfall later than June. When questioned for the causes for the increased summer rainfall, the invariable reply of experts was, that it resulted from the *unequal heating of the air* over the plain, brought about by the large forestry areas.

"On the north plain of Europe, including North France, Belgium, Holland, North Germany, Denmark, Prussia and Poland, we found a methodic system of forestry planting and preservation, and that all classes from peasant to prince united in the belief that 33½ per cent. of the country must be kept in timber, yet we did not here find scientific men united in the belief that forestry planting directly increased rainfall. But they did unite in the belief that large areas of forest tend to a more equal distribution of the rainfall, and more equable conditions as to temperature and humidity of the air.

"On the north plain of Europe forests have existed in more or less perfect condition during hundreds of years, hence the Russian experience in the way of extended timber planting on bare pastoral steppes, like our plains west of the Missouri to Denver, has more value for our guidance.

"As nearly as we can believe any proposition of science or any established principle growing out of long experience, we may believe that the Russian plan of great island groves over our western prairies will give us a more equal rainfall and more equable conditions as to summer humidity and temperature of air.

"With a despotic form of government we might hope to try the scheme in the near future, but left to the voice of the people the time of trial seems far off. Permit me to repeat the opening remark that it is uphill work to write in a satisfactory way on a subject on which I know so little or on which so little is generally known as *prairie climatology*.

"It would have been far easier to talk of species and modes and methods of planting the *blessed timber* in which I believe with an *intensity bordering on perfect faith*, as our final saviour and preserver from climatic ills and evils which each year are becoming more apparent."

## THE WESTERN PLAINS.

At the same time it may be mentioned that Dr. Berry, of Illinois, read an elaborate production which proved the author thoroughly informed on the subject of air currents and the causes which influence their course. The fact that the once verdure-clad western plains were yearly reduced to plowed ground, the further fact that the forests of the west and southwest and of the mountains were almost obliterated he said, explained to his mind the increased dryness from year to year of the air currents that sweep over the Mississippi valley. These currents are now dry and arid instead of moisture-laden as formerly. Again, tiling throughout the west rapidly carries off the rainfall to the rivers, from whence it flows in freshets to the sea, without, as formerly, remaining in the ground to become a source of vapour and clouds. The planting of forests at regular intervals throughout the west in his opinion, was the only remedy.

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## RAILROADS IN CONNECTION WITH FORESTRY.

A valuable statement in connection with the above has just been issued at Washington. Ten railroad companies, it appears, have busied themselves with tree-planting to a greater or less extent, of which the Kansas City, Fort Scott and Gulf R.R. have done most, having 1,300 acres in fine trees, six years old. The Acheson, Topeka and Santa Fe R.R. have started plantations at different points along their line, cultivated them carefully for five or six years, after which time they were left to care for themselves. They made good growth, and seemed perfectly at home in what was then a treeless country. Since that time settlers have occupied the ground, and many of them have planted trees in great numbers. The intention was to show an example, and it proved quite successful. The Missouri Pacific R.R. have planted 250,000 trees, which are doing well. The Southern Pacific R.R. have planted very large numbers.

To supply continuously the present demand for wood for railway construction in the United States it is calculated would necessitate a reserve of not less than a hundred million acres of well-stocked, thrifty forests.—Statement of Mr. Fernow, Forest Conservator, Washington.

One-sixth of all the fires reported are attributed to railroad locomotives. Some statements are made as to the liabilities of railroad companies in these cases as follows:—

In Colorado, for example, railroad companies are required to have a strip of ground not less than six feet wide, ploughed every year, between July and October, on each side of the line of road, sufficient to prevent the spread of fire. This is not required within the limits of towns or cities, or on roads running through mountains where ploughing would be impracticable.

In Connecticut the statute declares the fact that a fire was occasioned by a locomotive shall be *prima facie* evidence to charge with negligence those owning or operating the railroad on which the locomotive was in use. In Massachusetts, whoever wilfully or without proper care sets fire to the property of another is liable to a fine of \$250, and fire wardens are directed to prosecute such offenders.

In Illinois the fact that a fire has been started by sparks from a locomotive is made, as in Connecticut, presumptive evidence of criminal negligence.

The law of Maine enacts that when property is injured by fire communicated by a locomotive, the corporation using it is responsible for such injury, and it has an insurable interest in the property along the route for which it is responsible, and may procure insurance thereon.



In Maryland railroad companies are responsible for injuries occasioned by fire, unless they can prove to the satisfaction of the court that there was no negligence.

In Michigan railroad companies are made liable for all loss or damage occasioned by the engines or employes of such companies. It is provided, however, that they shall not be liable if the engines are in good order and properly managed; all proper precautions are taken to prevent the origin of fires, and proper efforts are made to extinguish fires in case of their extending beyond the limits of the road, when the existence of such fires is communicated to any of the officers of the road.

In New Hampshire railroads are made liable for all damages. They are also declared to have an insurable interest in all property on the line of the road exposed to damage.

The law of Vermont is similar to that of New Hampshire.

In New Jersey it is provided that engines must have screens, and the fact of fire is made *prima facie* evidence of the violation of the law.

The exposure of the railroad companies to complaints on account of fires originated by their locomotives, and to suits at law for damages, as well as other reasons appealing to their self-interest, have led to many and protracted experiments for the purpose of preventing damage to property arising from this source and inconvenience to passengers. Many contrivances for this purpose have been tried. Some have been, in a degree, successful, but most of them have proved failures in practice. Within a few years, however, spark-arresters have been devised which railroad engineers and managers declare to be so efficient in securing the end desired, that it would seem to be imposing no hardships on the railroad companies to compel them by law to furnish all their locomotives, as a condition of their use, with one or another of these safeguards. An eminent expounder of the English common law says that though railway companies may be expressly authorized by statute to use locomotive furnaces of a dangerous character, "no statute can exempt them from the consequences of negligence in the management of their railways, or the construction of their fire-boxes, chimneys or furnaces, whereby coals of fire are thrown on the adjoining property. If they neglect to avail themselves of all such contrivances as are in known practical use to prevent the emission of sparks from their engines, they will be responsible for their neglect, and if they run locomotives without statutable authority, in that case they are responsible for any damage caused by such engines in setting fire to adjoining property or otherwise, although they have not been guilty of negligence."

It would seem (says the report) that our interpretation of common law should be as extensive as that of England in protecting property from destruction by fires originating from passing locomotives, or that our statute laws should be made to accomplish the same end.

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#### SUPPLY OF WHITE PINE.

Of late years, many have prophesied the complete destruction of the white pine forests of America, have pointed out the amount yearly used, and thence calculated the period of its duration. Their prophesies have not been accurate, for according to many of them the pine supply would have ceased before to-day, whereas the fact is that the supply is still immense. The mistake in these calculations was that they did not allow for the fact that forests then considered thoroughly culled have since been gone over again and again, and large supplies drawn. We use, too, inferior wood. To-day a class of pine is used for many purposes which would have been thought too poor for these uses twenty years ago. Hardwood and hemlock, also, which would not have been touched when pine was plenty, are now largely drawn upon. The south, too, is furnishing pine, though, as said below, she is using more than formerly. But though the south has much timber, in great part it is in such inaccessible positions as to render it very costly when obtained. The

writer, who says below pine cannot be reproduced, probably means that in our lifetime we cannot grow a large pine. But I remember fields of forty-four years ago, now pine groves, whence could be cut many sticks of thirty feet, and eight, or even ten, inches square. There is no doubt, however, that the pine of the Northern States is fast nearing its end.

It may be of interest to publish the following extracts from a letter recently received from Mr. G. W. Hotchkiss, for many years Secretary of the Lumberman's Exchange at Chicago, recognized as an authority in lumber statistics.

He says : "So far as White Pine (*Pinus strobus*) is concerned, it occupies to-day a position in forestry analogous to the Indian in the body politic, practically a thing of the past. Of course there are sections which will last for many years (not so very many either), but the great bulk is gone, and like the straggling tribes, but a remnant of former power and strength remains, and but a few decades more and they will be known only in history as a thing of the past.

"One hundred years ago, Maine, Vermont, New Hampshire, New York and Pennsylvania, could boast vast forests of white pine. West of the lakes, Michigan, Wisconsin and Minnesota, so late as fifty years ago, were unbroken in forest resources, and the white pine predominated.

"To-day Maine gives us some spruce and a little small sapling pine, such as would hardly have been sent for firewood in her palmy days of lumbering. Vermont, New Hampshire and New York may still boast an occasional clump of trees, but have lost all pretensions of lumber-producing regions. Pennsylvania has a few hundred million feet on the sides of the Alleghanies, but has dropped out of the list as a lumber producer. East of the great lakes nought remains (excepting the spruce forests of Northern and Eastern Maine), save hemlock and hardwood, and these in very limited quantities, insufficient to supply the home demand in a majority of localities. Michigan, Wisconsin and Minnesota are the last remaining resorts for lumbermen east of the Rocky Mountains. Originally there was probably 150,000,000,000 feet B. M. in Michigan, but fifty years' work has reduced the supply to probably not over twelve to twenty billion feet, with an annual average cut for the past five years of not far from four and a half billions ; and the cutting is so close as to exterminate all the pine timber on the tract operated upon. Wisconsin can hardly be estimated at over thirty to thirty-five billions, little more than would suffice to supply the consumption of the United States as a whole for one year.

"Minnesota, set down in the census of 1880 as having 11,000,000,000 feet, B. M., an amount disputed by some as too high, by others as too low, if allowed to-day at 10,000,000,000, could furnish but one year's supply for the mills of the north-western pine producing states. In fact, if the mills of these three states were run to their capacity for six years, there would be but little pine left for the seventh year's production. And these estimates of timber include the red and Norway pine, which forms a noticeable percentage of the whole. In Michigan and Wisconsin there are still large quantities of hardwood, but it is not being cared for with that appreciation of its value, which is desirable. It has, however, this advantage, it can be reproduced ; pine cannot. The future timber supply of the east must be largely from the hardwoods. The vast forests of the Pacific slope will supplement this with such soft lumber as may be needed. Before many years the forests of Alaska will swarm with enterprising timber seekers. Already those of California, Oregon and Washington Territory, have been the subject of research, and vast amounts of eastern capital are already invested there. British Columbia, west of the mountains, will supplement the supply, but our children will bring their pine and fir from Alaska. Meantime the supply east of the Rockies, once denuded, will be known no more, except through wise Government action in protecting and encouraging timber culture. Our present laws in this respect, so far as they relate to taking up land, are a farce, falling little short of tragedy, as the Government parts with the land without accomplishing the purpose of the grant in one case in a hundred, until it has lost control of all sufficient areas, which might be made a blessing to our successors in life's race.



"I have not for some years given the southern production so much thought, so far as statistics are concerned, and can speak only generally. There has been a great impetus to trade in the south during the last five years. You will be safe in computing the consumption of all kinds of wood at 500 feet per capita of the population, and at 8,000 feet per acre, it would take about 4,000,000 acres per year for its supply. In southern timber both the long-leaved and loblolly pine grow, and can be reproduced in their native soil, so that the statement above, that "pine does not reproduce itself," applies 'only to the white pine of the north.' I know of no good reason why Government endeavors to foster and perpetuate large areas in the south would not be eminently successful. But it should not be delayed, as the wastefulness which has brought the white pine resources of the north so near their extinction, is rapidly doing the same for the long-leaved and loblolly of the south. It is to me a source of surprise that some of the lumbermen of the country, men who are, or have been, tramping through the forests for scores of years, are but now awakening to a perception of the true condition of our forests. That they have opened their eyes to the truth is made evident to those, who, like myself, are in position to know of the search which is being made for desirable bodies of timber, by men who six years ago set down the Government estimates and statements as veriest bosh, and loudly asserted that no diminution in present annual supplies would be seen for a generation to come."

## CHAPTER V.

### THE NORWAY SPRUCE.

#### METHOD OF GROWING IT FROM SEED.

There are many young men who intend their lives to be passed in the occupations of agriculture—the most pleasant—and if we would aid nature instead of thwarting her, not the least profitable of occupations. There are many fathers who propose that certain of their sons shall so pass their lives. Of these, some now understand; others are rapidly acquiring the idea that the forest, as represented either by lines of trees, by plantations, or by the remains of our original wood, must be retained and assisted, or our farming lands will dry into barrenness, as has been the case elsewhere. The classes of whom I speak will plant trees—many of them are planting thousands. It will be well to introduce the suggestion that, to those who have—and many have—time to look forward to in which to labour, much more pleasure can be derived from growing the tree from the seed than from buying the saplings. To see the tree, in years to come a forest monarch, burst from the diminutive seed and rear its tiny shoot amid the soil; to know that it, in days to come, deep of root and vast of spreading foliage, will act as the rain-bringer to a thirsty summer soil, and that our work has caused it, this is more than money, more than praise. Well, he who grows his seedlings can multiply the prospect by millions. And there are more than climatic considerations. "What was it," asks the observer of nations, "rendered the successes of Nelson possible? The oaks which Evelyn grew." And, without planning either the means of destruction or defence, how vast the possibilities of good to be aided by our future forests. It cannot be that in Ontario, among

our patriotic young men, we have not many an Evelyn likely to give good assistance in the task. But here let us say that, though it is fair to print the opinion of our seed-grower, himself an amateur, that all do not agree with him as to the greater advisability of buying trees. To those who have no time to spare, or who wish to save, or who want but few, it may be well. But those who can should say, grow, or attempt to grow, from seed; even the attempt will give an enthusiasm which may be lacking without. As for the deciduous trees, there is no difficulty in growing trees from their seed; do it by all means. But with the evergreens, if you can afford it, try it, there is much pleasure in it. Let us also say, this is the experience of an amateur; be not rendered timid by his doubts; he succeeded well. The next statement, that of a professional, breathes no such hesitating counsel, but says plainly that the work is easy to the careful. Naturally, all work is difficult to the careless. I trust before next year to hear of many amateur Norway spruce growers.

Of all trees fit for evergreen wind-breaks in Ontario, it seems to me that the Norway Spruce is probably the best for general purposes. Our native pine is no doubt excellent, but of much slower growth. Our balsam spruce, found in many Ontario forests, is frequently used, but I have lately heard of some failures after the age of twelve or fourteen years. The White Cedar will not grow, in some soils, to such a height as a wind-break needs, though in its native wood it produces magnificent trees. Our tamarack I have found wither and fail in numbers after twenty years. But with the Norway spruce, after having noticed it carefully in many soils and situations, I have observed no failure, except where unnecessarily pruned to a low wedge shape, which killed it. In twenty years I have known it in fair loam soil to form an excellent wind-break of forty feet in height. This was where three rows were grown, twelve feet from each other, and the trees ten feet apart. They had also the protection of a double row of pine, previously standing. It will be seen that as one tree always assists another, these had thus a special advantage; but in lines by themselves they will grow well. As it is best to give only information thoroughly practical and reliable, I have obtained from a gentleman, lately resident in Hamilton, where he grew the trees in question, a full description of his method of raising these valuable trees from seed. He had, by these means, fifty thousand young Norway spruce this spring ready to transplant. Of course, supposing the case of a small quantity, as he himself observes, it would be cheaper to buy of a nurseryman, or import from the States or Britain. But the raising of young evergreens from seed is an occupation in which much pleasure is to be found. It is also one of much pride to the successful grower, for such have been the difficulties that many have failed. It must be remembered, too, that Hamilton is in a portion of Ontario more southern and sheltered than most others. However, with the light afforded by those who have trodden the path of successful effort, there seems no reason to apprehend failure. This successful grower, an enthusiast in tree culture, I regret to say, sailed for New Zealand this spring. In his parting note to me he remarks, concerning the following directions, "I will guarantee that anyone following them will have a fine crop of trees. Remember, keep on the screens; the less sun the better the first year, but all the exposure in wet *overcast* weather, and at night *free* from frost. A very little sun morning and evening the second year; the cotton allows quite enough to pass all day through."

It would be a matter extremely valuable to Ontario if this method were practised by a few individuals who reside in suitable localities. Many millions of young trees might

be easily raised, and these dispersed through the country in protecting lines, or in broader plantations, if desirable, would be of infinite benefit. They should, to obtain a densely fibred root, be several times transplanted, after which, always remembering to keep them moist and covered between digging and planting, they will grow in most soils. I have noticed them receive a remarkable impetus from being mulched with rough manure immediately after planting; a thing which, in fact, whether with straw or manure—though the last is the best—should not be omitted with any tree. Manure is too rank, often, to dig in with the roots at planting; but mulching with it allows the filtering through the earth to the roots of the precise nourishment needed. It is, too, the easiest plan of the two. I will now give, in his own words, our spruce-grower's method and experience:—

“It has been well said that ‘gentlemen plant trees but blackguards cut them down’—that is wastefully and wantonly—and not lightly nor recklessly should we lay hands on that mantle of living green, of all colours most restful to the weary eye, and which, cast by the hands of an All-wise Creator, drapes and veils the scars left by the Titanic struggle of fire and water.

“It may, however be urged, by way of apology for Athithopol of these latter days, that he is perpetrating the lesser evil, when, after his bungling manner, he compasses the destruction of some patriarch of the woodlands.

“While the ‘unsteady vulgar,’ in blind and indiscriminating fury raise axe and torch, there are, thank Heaven, a few who cherish those things, without which, earth would be a desert. Yet even of these the saying holds good, ‘Many are called, but few are chosen’; and as in the case of Gideon's followers, the paucity of their numbers does not forbid rejection, for we may say of their devotion to nature what the poet wrote of Wisdom and her worshippers:—

‘To some she is the goddess great,  
‘To some the milch cow of the field.’

“Amid all sorts and conditions of men are to be found fanatics and enthusiasts, from Archimedes to the latest discoverer of perpetual motion, who only want ‘one more wheel’ to achieve the impossible. Yet to those who may contemplate attempting to raise evergreen trees from seed, with a humorist, whom time has almost rendered classical, I would emphatically say ‘don't.’ The advice is not prompted by a sense of failure, but the late Dr. Hough, of whose kindness I have a grateful memory, quoting from Prof. H. H. McAfee (*vide* Report 1877, p. 35), says, ‘Evergreen are Larch seeds, which, by the way, ought not to be attempted by anyone not trained to the nursery business.’ It would be folly and waste, both of time and money, for anyone requiring a few thousand Pine or Spruce, to attempt raising them from seed. Far better to purchase from one of the many nurseries scattered throughout the Province; while for those who, like myself, prefer the American nurseries for the greater variety they offer, there is the gigantic establishment of Messrs. R. Douglas and Sons, Waukegan, Illinois, where, in 1871, twenty-five millions of forest trees were offered for sale; inferior only in point of size, is that of Mr. W. W. Johnson, Snowflake P. O., Antoine City, Mich. It gives me great pleasure to acknowledge the uniform kindness and courtesy of these gentlemen, to whom I am greatly indebted for information and advice.

“‘Let it be granted,’ to quote from the McChokemchild bible, that an attempt is to be made to raise, say 100,000 Norway Spruce. In the first place it will be necessary to select some mellow piece of sandy loam, with rather more loam than sand, and naturally dry or capable of being rendered so by drainage. It will also be necessary to have an abundant supply—natural or artificial—of water, and the means of pouring it on with unstinted hand in the parching months of the brief Canadian summer. Then in the month of September, let a plot, 120 ft. by 14 ft., be trenched two spades deep, and, at the very least, let six inches of well-rotted dung be thoroughly incorporated with the whole mass of loosened soil. No pains need be taken to level, or rake the earth, but it may be left to the action of the air and frost for the winter. If the manure be not thoroughly mixed with the soil, but be left in a mass at the bottom of the trenches, not only is it out of the reach of the young seedlings in the earliest stage of their growth, when they most need it, but as the mass diminishes in bulk, through the progress of decay, the superincumbent



earth settles, causing the formation of large and deep cracks, along which the young seedlings perish. The following spring, as soon as the ground is fit to dig, let the earth be turned over, then drive stakes four feet long by one inch by two inches, six feet apart, making two beds, 120 ft. by 6 ft., with path 2 ft. wide between the beds. The stakes should be of cedar, if the beds are to be used for a succession of years. A block of wood should be laid on the heads of the stakes, to take the blows of the hammer when driving. The lines of demarcation should be perfectly straight, parallel, and the corners should be right angles. Nail boards on inner sides of stakes, sinking them sufficiently to allow for settlement of soil, the upper edge being about 18 inches above surface of earth in bed. Each plot will now resemble a gigantic hotbed, minus the glass, and they are thus boxed in to prevent evaporation of moisture by drying winds. Let those who wish to ensure the very best results possible rake their beds level and fine, as for onions, then spread an inch of well-rotted dung uniformly over surface, to leach in with spring rains, raking off manure just before sowing, with as little disturbance of the earth as possible. We are now ready for the seed, which can be obtained from cones gathered during the previous autumn and winter. In Germany they are put in cylinders like coffee-roasters, artificial heat, obtained by burning spent cones, is applied, the cylinders being turned by hand by cranks outside the drying-room. If stored in a dry place, where a gentle heat can reach them—either that of the sun, from the flues of a greenhouse, or that from an ordinary stove, taking care that the temperature is not sufficiently high to destroy vitality—the scales will open, and beating them with a light stick will liberate the seed. It can also be procured from any respectable seedsman, or from the gentlemen I have named, at a cost of one dollar per pound and express charges. I used that from cones, and also ‘Best Imported.’ It may be fancy, but I thought the last gave slightly better results. The average production of plants per lb. of seed being 9,000 (*vide* Brown, the Forester, p. 505), we will require from 12-14 lbs. Take a small quantity of flour chalk dust, or whitening, mix with seed, and shake till every seed is thoroughly coated, so that one can detect at a glance if the seed is uniformly distributed in sowing. After all danger of frost is past, when rain threatens, scatter all but two lbs. of the seed as evenly as possible, passing a light roller, such as that of a lawn mower, carefully over the seed. To cover, a couple of cart loads of clean sharp sand, free from any admixture of soil, stones or gravel, will be needed. Such sand as that at the mouth of Grimsby Creek, or at Hamilton Beach, is the kind required, being free from any tendency to cake. This should be carefully sifted or scattered, the depth not to exceed one-fourth ( $\frac{1}{4}$ ) of an inch. These trees—so hardy when they have attained some age—are, in the early stage of growth, of the most tender description. Heat, light and cold are alike fatal, if they can reach the frail crop. To guard against all three, screens are necessary. Messrs. Douglas employ those made of lath, the spaces being narrower than the laths; others use hurdles, made of brush, but I think that strong unbleached factory cotton, yard wide, costing 10c. per yard, is by far the best; and using this material, it will be better to make the beds 6 ft. wide, rather than 4 ft., as recommended by Messrs. Douglas. A slender framework of battens, 1x3 inches, should be built upon the boxing of the beds; the cross battens to be let in flush with upper edge of boxing, to be on edge for greater strength and free passage of light and moisture. The two longitudinal battens to be carefully put together on the flat, no projecting ends or nail heads being visible. The space between cross-battens not to be more than 3 ft.; if greater, the cotton sags in wet weather; the water collects at one point, with destructive effect on the soft earth, instead of being evenly distributed. Any method will answer that will strain the cotton to a flat surface and at the same time permit the rapid handling of the screens at the approach of rain or the breaking out of bright sunshine. These screens should be stretched as soon as possible after sowing, as birds are partial to the seed. Their edges should fit closely to the boxing, to exclude the the wind, as the great area, when ‘filled,’ will severely try the strength of the material. Lastly, 50 ft. by 6 ft. is about as large a surface of cotton as can be rapidly handled by one person. It may be necessary to water the beds before the seed germinates; great care must be taken, in this event, to supply it in as fine a spray as possible; if thrown on with any weight or force, the displacement of the seed will inevitably result. In the course of a few days, if the weather be propitious, myriads of little spires will gladden

the eye by their appearance. Should these show that the seed has not been evenly scattered, the two lbs. held in reserve will make good any deficiencies. The watchful grower will observe a minute grey moth, not half the size of a small house fly, busy on no good intent. To meet these and other insect pests, the following mixture will be found of service: Eight quarts of water, and less than one teaspoonful of Paris Green; or better, eight quarts of water, one quart of strong tobacco juice, and less than one teaspoonful of coal oil—in either case to be thoroughly and intimately mixed, and applied with a fine rose on the watering pot or syringe. I find the syringe made by P. C. Lewis, Catskill, N.Y., to be all I could wish. They are expensive, but will last a careful man a lifetime. One word of caution may be useful: Never, on any account, leave the rubber plunger in the tube; it will set fast, and the effort to withdraw it will be destructive. The metal being thin, the syringe must be handled carefully. Little remains to be told. If the land has been prepared as directed, manure being applied with no stinting hand, the seedlings will come on rapidly; there will be very little ‘damping off’ or dwindling; and I believe that the taint of the manure renders them less inviting to insect attack. The careful destruction of all weeds by the finger and thumb, as soon as they appear, is a *sine quâ non*. The removal of the screens *after* sunset, their replacement before the sun strikes the beds on the return of day, frequent and copious watering when required, to be given only when the sun is off the beds, frequent syringing and incessant care and watchfulness, will be rewarded by the growth and vigor of the crop. Commencing with the last week in August, water should be withheld or sparingly applied, so that the crop may ripen the wood. When threatened with killing frosts, leave the screens on, but remove them at every possible opportunity, to subject the seedlings to natural conditions of life. They will thus be gradually prepared to bear the winter; not, however, without artificial aid. Before severe frost sets in, and, if possible, after a heavy snow fall, the beds should be closely covered with slabs or two-inch planking, as the weight of snow is often very great. Should it be necessary to cover the beds before snow falls, the planks should be piled one on the other, as the storm comes up, and the snow allowed to drift in through the openings, the planks being replaced before the subsequent thaw sets in. At the approach of the next storm, the removal of the alternate planks will cover the whole bed with a fleecy coat, the best preservative against the variations of temperature from which we suffer. The planks must be left on till all danger of winter killing is past; any seedlings hove out by the frost being carefully replaced with the fingers. The second summer is like the first—demanding incessant care and attention. Though I did not do so, I think it would be advisable to replace planking at the approach of the second winter. The third spring I would plant out, not in field rows, where the mortality may be heavy, but in nursery beds in close drills. These beds should be rich, and water and screens will be necessary till the seedlings are established, when a little of the morning and evening sun may be given. After two years in these beds the trees will be fit for field culture, in drills 14 inches apart. Space must be given in the drills, or the lower branches will be compressed into an oval, instead of expanding into the full circle. I have taken the Norway spruce as typical, the other variety of evergreens offering but little difficulty to the successful grower of *Abies Excelsa*.”—CANOPUS.

#### PLANTING IN SCHOOL GROUNDS.

“Let me make the songs,” said the poet, “and I care not who makes the laws.” It might be said, now-a-days, so great is his—or often her—influence, that if the school-teachers unite in favour of a policy, sooner or later it will be that of the nation. Nor is there any class to whom the future of the question here discussed could better be entrusted. Acquainted as they should be, and no doubt generally are, with the history of nations, they know that, exactly in proportion as the forests which should secure shelter and proper humidity to a country were preserved or destroyed, so the land gained or lost in



fruitfulness, and the nation in those sources of strength which the field and forest nourish. In Ontario necessary clearing has led to over-clearing; vegetation is suffering, our timber resources are diminishing all too rapidly, and the facts need to be impressed on our youth. For this, the province looks to the aid of the teachers, and, to give some slight assistance in the way of suggestion to those teachers who may be disposed to add example to precept in the surroundings of the school, this article will treat of planting in school grounds.

The first idea of classical education we historically possess, is the remembrance of the academic groves; and surely, our school grounds, should have such appertaining; but with how few is it the case? The city instructional edifice is a brick building, surrounded by a Sahara of planked yard—its country relative often a wooden structure in a bleak quarter-acre lot. Nevertheless, our grumblings over the matter need not be too intense. It is progress, and great progress, that we have them at all. It is but a few years since nine out of ten of them were not. A vast advance has been made. We have the schools; now let us have the trees.

A school should not be overhung by embowering arbors of waving foliage, nor picturesquely situated among, and half hidden by, sturdy oaks and graceful elms. Walls and roofs should be given their full chance of sun-light; the shade is better to fight in than to live in; an inflammatory rheumatism is too high a price for a cooling breeze. In short, it is not well to have too many trees near the house. At some distance it is well to have plenty of them.

A great point is that of shelter; and this is generally necessary on the north and west. Nothing but evergreens will give us this, therefore along the north and along the west of our school inclosure we should have them in such numbers as the ground at our disposal will permit. For my part, I should like to see a good acre of our white Canadian pines (there is nothing better) on each such flank. There is no grove so healthy as a pine grove; from no other such mass of leaves will come on a summer's day such balmy zephyrs to your open school-house windows. Such groves would well supplement the playground, and they would also supplement the school-house, for they would teach a lesson—a lesson not in the books, a lesson to be learned from example alone. The ground and the trees would be valuable; they would represent money; they might be converted into it. That they were not so converted would teach the pupils that trees had a use more valuable than to build houses withal, to be sold for a thousand pence, or to be cut down that fat bullocks might feed where once they stood.

Yet, if we have but a small lot to protect and beautify with trees, we should run a single line of evergreens along the north and west and let them branch to the ground. The evergreen needs every lower branch for many years; for one reason, that its trunk and the ground beneath it both need shade; for another, that your wind-break is no wind-break if the air has full sweep beneath it. For choice of trees, the pine will give a tall, dark, solid row; the cedar, one of lower height and closer texture; the Norway spruce, a lighter green and more picturesque line of conical summits. Of these, the cedar of course will thrive on the moister soil. And, by the way, when we come to planting them, there are four things to be looked for, namely, a small tree, good root, kept from sun and air until the moment of planting, and a depth no greater than its forest bed. It is true that by planting deeply, we hold the tree root in the ground firmly, a very necessary thing to do; but by this over-deep planting we often find ourselves, in the course of a year or two, holding a dead stick in the ground very firmly; not at all a necessary thing to do. The trees should be planted firmly, but where the wind can affect them that firmness should be secured by staking, not by planting the roots so deeply that heat and moisture cannot do their work. Give these a fair chance, in fair soil, and the tree will soon make itself steady enough. Till then, if necessary, tie it, and, by the way, do not let your ligature ingrow.

If there be room enough, supposing we have planted our rows of evergreens on the sides to be sheltered, we shall have an improved climate in our school grounds; but we

can greatly add to the beauty of our row if we have room to plant another row inside, twelve feet from the first, and let this second be of the soft maple. When both are grown up, the light green in summer and the bright scarlet in the fall, of the maple, will produce a beautiful effect against a back-ground of evergreen. But this must be managed, for your maple will grow much faster than your evergreens. If in a hurry, place the maple in the rear ; if not, grow the evergreens to fifteen feet high, then plant the maples ; but you can vary this as you choose. Soft maples are cheap and easily raised ; when they grow too large, cut them down ; plant again. Nature will give you leaves and trunks in profusion, if you court her ; if you stint her, she will give you barren and lifeless stalks, as if to testify her derision. It should be remembered, too, that for the soft maple, damp ground is better, where, by-the-by, the cedar would well form your back-ground. If high ground, take the hard maple and the Norway spruce. And now two sides are done. For the rest, the south and east, we need no screens. Here we require, at fair distances, separate and beautiful trees. Say thirty feet is resolved upon, plant them fifteen, and in ten years cut out half. In the meantime, with the same expenditure of ground, you have twice as many growing trees for ornament ; and there is nothing more beautiful, if once we educate our eyes to perceive their beauty. The man who passes a succession of beautiful trees unobservant, as of so many pebbles in a walk, lives his life out without obtaining one-tenth of the pleasure his eyesight might have afforded him.

Of trees to choose from, we have in this climate a vast choice—the firm unbending oak ; the slender, lofty, swaying ash ; the urn-curved elm ; the beech, with its successional shelves of foliage ; the basswood, broad of leaf, deep of shade, white of blossom ; the white-stemmed birches, upright and conical in the cut-leaf, divergent and leaning in the common ; the maples in their infinite variety (choose the soft for the wet land) ; the mountain ash, with its clustering berries ; the larch pendulous with a myriad festoons of light and glancing green. All these, any of these, will do well for the south and east sides of your enclosure, not too near the house ; and when they grow large, not too near each other. On the north and west we want the shelter of evergreen belts ; on the south and east, merely the beautiful effect of occasional and isolated trees.

But let me take the opportunity of warning against the too common course of enthusiastic beginners, the tendency to plant largely and care for slightly. Of what use is it to plant one year numerous fine trees and in the fast following years to leave them unwatched till they dry to death slowly, or to leave them unprotected from cattle, to be bitten to death quickly ? “Ninety per cent,” writes one correspondent to me, “of our carefully chosen and nicely planted trees are now dead for want of a little care till they should grow beyond the need of care.” Let me therefore sketch the needs of tree-planting :—

All trees do well on loam, fairly drained.

Pine will grow on poor sand.

The soft maple and the cedar will flourish on a soil more moist than most others will bear ; the last on a soil rather low, however, than wet.

Mulch all trees—that is, the year they are planted spread around them straw or other such material, three feet in radius and six inches in thickness. I have seen stones used with good effect to keep this in place. This prevents the sun from drying the ground. Another way is to stir the ground shallowly twice in a summer.

Keep cattle away from all young trees. They will destroy in a minute what yourself and nature have been three years in doing.

Always remember that, if we choose to take care of a row of trees, plant them well, stir the surface frequently, or mulch it sufficiently, and generally watch their welfare, we can make that row of trees grow three times as well as will a similar line uncared for, if it live at all. There is a deep pleasure to be obtained from watching the success of a thriving plantation. The bark stands smooth, clear and healthy on the stems ; you can almost see the vigorous branches extend themselves, as if grateful for your care ; great masses of leaves, broad, bright, and many-veined, will spread themselves forth rejoicingly in the sun ; and as you seek their cool and fragrant shade, will wave and flutter above your head, an ever changing kaleidoscope of picturesque verdancy.

When you plant your trees, grudge not a little care. What is it to bring a wheelbarrow of sand to a clayey site ; one of clay to a place too sandy ? You are planting a tree by which your grandchildren may remember you—which, perhaps, shall for many a year do its uttermost—dumb, yet living ; silent, yet sensitive—to please yourself. Its grateful shade shall cool you in the summer day ; its shelter cherish you in winter time ; or if it then be bare of every leaf, each denuded branch shall speak to you of a time when you shall also appear as lifeless, and of a resurrection as certain as the coming spring.

Pupils of the Canadian schools, the remembrance of many a century past, the knowledge of many a nation existing, lies open to your view ; the printer's art—to your ancestors for many an age unknown—sets before you the past and present as in a vast and magic glass. Look in that mirror, and you will see the citizens of certain nations, swayed by a pitiable and a mistaken view, adopt wealth as the standard of happiness, and realize by lifetimes of successive disappointments the greatness of the error they have made. Of such error is his a branch who expects to win pleasure by stripping his ground of every tree, wrenching from every rood all food that it will grow, careless that such denudation destroys the upper and the nether springs, and hinders the refreshing coming of the summer rain. Shall not yours be a different course ? The land was not given us to destroy its fertility ; to leave a desert to those who may succeed. Will you not aid what you may in benefiting your country by preserving, where you can, some slight portion of her ancient forests ; aid what you may in planting and caring for some newer trees ?

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### TREE-PLANTING ON ARBOUR DAY.

As of late years, our schools, invited by the Educational Department, are making some excellent movements in this direction, it is likely that at first the greatest progress will be made in and about the school grounds of the Province. Here, I must, if I suggest at all, but try to further my view, that a school ground should contain, not alone a playground, but a goodly sized grove as well. Let the boys have a couple of acres, by all means, to play in ; and two or three more where trees shall grow, and not grow sickly and stunted, but be cared for. Why, if the school teachers and school trustees of Ontario aid in the matter, we shall soon, by very force of example, have our country well sheltered once more ; and our living springs, now drying up by deforesting, bursting forth again. Give but sufficient room, and each school ground will be, so far as trees are concerned, a valuable experimental farm. What school section could not afford five acres ?—surely not one. There are many reasons for some slight liberality in this matter. Let any one observe the tramped and muddy door-yard in the small plot allotted to most county schools, (the place where, in the absence of better, they must congregate,) and think how much greater for good the influence on the pupils had they a handsome and well-sodded lawn for play—a thing attainable with ease where the number of pupils who shall tread it is not more than is ordinary in such places of education—with a pleasant grove annexed, and sheltering trees and flowers around outside the playground limits. Such surroundings dignify education and impress the pupils with ideas which may benefit their whole after lives. Or, to state the question in another way : They must have room to play ; they should also have room for trees, groves and flowers. To give them both demands more than the ordinary stinted allowance, and once afforded, if it be but cared for as the labour of so many little hands can well care for it, what lessons of order, beauty and utility can be inculcated in the process. Little can be done to beautify a pent-up quarter of an acre, through which fifty children need to run.

Well, then, suppose that five acres were allowed in each section in country localities, its exposed sides would afford an excellent opportunity for proving the benefit of evergreen wind-breaks. The whole north side might be planted with evergreens in a belt, say a hundred feet in breadth, which would afford, in summer time, a pleasing and shady grove ; in winter, a shelter against the cold winds of the north, generally our keenest visitations in that season. The western side might have a close single line of evergreens.



The others—that is the eastern and southern sides—might be bordered, as before suggested, with some of our many beautiful deciduous trees—the maple, the elm, the basswood, (this, elsewhere called the linden, I should like to see planted more extensively, its broad, thick, soft leaves, are said, of all trees, to cast the coolest shade; its blossoms are most valuable to the bee. Pupils of English literature should not be unacquainted with Landon's touching apostrophe to the linden). Then there is the locust (where it is not troubled by the borer). But I need not extend the list, merely remarking, that if there be a place where suckers are not likely to spread, which surely should be, if any, a school ground, where there are so many hands to pull them up, the silver-leaved poplar will grow in one half the time taken by other trees. The variety with small catkins should be chosen; it does not, in the season when they fall, make one-fourth the litter made by that which grows the large; though, at some distance from a house, neither is an annoyance worth mentioning. If we choose these, a slip of eight inches of last year's wood, cut from a bud to a bud, and thrust in the ground five inches, will grow. There are many other beautiful deciduous trees; but the residents of each locality should know best what grows well there. For instance, on some high, windy plateaus, the rock elm grows well; its deep roots hold the tree firmly against a wind which would shake the roots of a young maple loose. Then there is taste to be exercised in the choice of trees as to shape and foliage. The elm will give us the tall divided stem, branching out into a curious but picturesque urn-like shape—the maple a rounded cone of foliage—the aspen a perpetual play and shimmer of changing tints—the beech great successive layers or flakes of leaf-masses. All these trees are easily grown. Then, for flowers and shrubs, the near vicinity of the school-house itself would be the place. This, as said, sketches out the idea of what might be done with a school ground of five acres. The colder sides would be walled by evergreens—say our own pines, which experience proves to make an excellent grove—the others would have their line of deciduous trees, not too near one another; on those sides we do not seek shelter, but occasional beautiful trees with broad openings between—the school-house, its shrubs and flowers, and, if you like, its verandahs and trailing vines. Ample room would be left for a broad expanse of grass-grown play-ground. Would it not be worth while to give the children this instead of the half-acre often given them?

But take the half-acre itself, if we must; what can we plant there? These small plots, planted or not, will not of themselves influence greatly the atmosphere. But they might well be the experimental commencements of what will very greatly do so. Suppose the boys try a row of evergreens, getting the little plants from the bush six inches high, planting them in beds for a couple of years, till good roots are formed, then placing them where they are needed—the best way. Or, if in a greater hurry for larger trees, get them five feet high *from the open* in the end of May or beginning of June—these are different in this respect from deciduous trees, which you may plant any time in spring or fall—they will generally grow very well, though the transplanting gives you a tree more likely to last. Or, let me suggest another thing which might be done in a school plot. Set aside a portion, sow it with tree seeds, care for the young plants, and when ready give them to such adjacent farmers as will agree to plant and attend to them on their farms. In this way the school might be made the nucleus of numerous groves and miles of wind-breaks, and the boys, grown to manhood, might view with pride their well-sheltered neighborhood—its orchards with their protecting lines of Norway spruce—its fields guarded by plantations of maple, hickory, ash, oak, and many another valuable wood—its landscape of country neither parched in summer nor wind-swept in winter, but rejoicing in alternate fruitful fields and waving woods—and say “Do you see how beautiful this is? We little fellows at school, long ago, started it all.” But Arbor Day is not confined to scholars; many a villager and many a farmer will participate in its occupations. In villages, perhaps, I might be allowed to recommend that grass be not left close to the tree. As each summer comes, if the ground be stirred around the stem, say three feet each way, and perhaps a little addition of better soil or manure mixed shallowly with the surface earth, we shall much sooner have a fine tree. Stirring the ground twice or thrice a summer is better than mulching and looks infinitely better. As regards farm planting, I would suggest that there is too much planting on the road in front of the house. It soon shuts the farm altogether from view; neither is too much of it good for the roads.

Of course the exposed sides should be planted, but when both objects can be obtained, what looks best is to see a farm protected by tree rows on both sides, by a grove at the back, and open to the road. There you see the farm, its buildings, its dark ploughed land, its green fields or its golden harvests, set in a frame of foliage on three sides—a picture worth admiring, which the next farm should vary by another, different but as beautiful. But if the roadside be thick masses of branch and leaf, as a wind-break should be, the farmer has planted you out; the farm may be worth looking at, but it will hardly please the eye of passengers who cannot see it.

I trust that, shortly, the whole population of the country regions, and many of the towns, will make a point of aiding in tree culture at least the whole of Arbour Day. For this we must look to the teachers. What they now inculcate and practice will be followed by their scholars many a year to come.

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### THE PROCESS BY WHICH WOODS PRESERVE MOISTURE IN ADJACENT CLEARED LAND.

We may speculate in uninformed fancies for ever without beneficial result; but if we wish the important knowledge of how best to avail ourselves of the workings of the great natural forces which, as we work with them or against them, will either render our fields fruitful or turn them to a desert, we must proceed to the workshop of Nature, and examine her operations for ourselves. If my readers will in imagination accompany me to the fields, view in fancy the young crop throwing up its millions of tender shoots, see it heighten, increase and ripen in the sun, watch meanwhile the necessary and important part which occasional moisture has in this, the sources from whence it is derived, and the manner of its aid to the growing plant, we will endeavour to get a plain and, if possible, a thorough understanding of the affair, in order to which I will ask them to read carefully the remainder of this chapter.

The history of all countries proves that when forests disappear, fertility never remains; and it has been remarked that, as one part of the method whereby this injury is inflicted, that the rapid passage of the wind over the earth, when no masses of trees break its force, must have the effect of too rapidly exhausting the moisture in the ground. The manner in which this is accomplished is very interesting, yet in all the range of the various writers on these subjects, I have not found any who had hit on the explanation of the process, (or if they had, had not thought it worth illustration), which I am about to endeavor to describe. Yet it is, of all others, the most important in connection with this matter; and, by following certain facts we know to their direct sequence, we shall find that it must be correct. In the first place we know that all plants and trees derive what food the earth gives them through openings in what are called the spongioles of their roots. But the nourishment close to these soon becomes exhausted. How does the root receive the food which lies a little way from it? By means of the great carrier of plant food—water in motion. There are two movements of water through the soil which chiefly effect this, namely, that of gravity, by which it is attracted towards the centre of the earth, or rather to a certain depth within the crust; and that of heat, which draws it up to the surface and into the air. There are other movements, but these two all are acquainted with, and it is they which chiefly do the work. And it is to be noticed that the provision of nature is that water will seldom carry plant food too deep, for most soils filter it too quickly. On the other hand, vapor does carry it upwards, as the aroma of a damp rich field when the hot sun comes from behind the clouds soon tells us. These two upward and down-



ward movements of water through the soil carry the plant food within reach of the attractive influence which roots possess. This is the principal cause, apparently, why growth is so rapid and vigorous after a shower, an assisting but lesser cause being also the cleansing of the leaves and opening of their pores by the rain. Vegetation will, at such times—while, as remarked, the water is passing through the earth downwards and upwards, (for, if watched, both these processes can be seen proceeding at one time), and during the longer succeeding period when, the first process chiefly concluded, the second, of vapor rising from the surface under the influence of the sun's heat, is still continuing—make very rapid progress indeed, so that it is common to say that the crops can then almost be seen to grow. The facts above-mentioned form a link in the chain of reasoning concerning the value of shelter to fields.

When a shower falls in summer, as noticed above, all can see the effect in increased growth. The effect is, as said, largely owing to the passage of water through the soil, both in separating and preparing the atoms of plant food in the earth for nourishment to the growing plant, and in carrying them within reach of its roots. It is now to be noticed that where fields possess the shelter given by woods this valuable process will last much longer, for this reason, that the moisture will remain in the land, drying out slowly, while in an open country it probably would not last one-fourth of the time. We will understand this better if we consider how it is that the rapid passage of currents of air across a country carries off its moisture. One stratum of air passes across the ground, and receives from contact a certain proportion of the moisture in the soil. But that stratum does not continue to pass next to the ground, for the vapor of water which it has received being much lighter than air causes it to immediately rise and be replaced by a drier one, which in its turn carries off its share. This process goes on, of course, when fields are sheltered, and is valuable to growth. But when they are not it proceeds with unnecessary rapidity, so as, especially in a dry time, when every shower is valuable, to deprive the agriculturist of much benefit his crop might have obtained from the portion of rain which fell. A sheltered field is dried by a slow upward movement of vapor. An unsheltered one is dried by the rapid, half circular, or elliptic movement of successive waves of air—a natural drying machine, in fact. From the above anyone will see the reason, so far as at present understood, why greater rapidity of growth may be expected in crops, other things being equal, where sheltered by woods or rows of trees. The passage of water through the soil, downwards by gravity, upwards by the sun's attraction, is the great means of bearing plant food to the roots. That movement is much and injuriously shortened where currents of air sweep uninterruptedly over the soil.

We will carry the description of the process of growth a little further, so as to give a fuller idea of the movement of moisture through earth and air. The plant or tree receiving nourishment by its roots receives also much water, which is the vehicle carrying it. By this it is carried to the leaves, and there exposed to the action of the air, which gives it all that portion—a very considerable quantity—of plant food, which can not be obtained from the soil, but from the atmosphere. Thence the food is sent to all parts of the plant, but the water does not remain in it; most of this has passed in vapor away from the leaves. How great the quantity of water thus passing into the atmosphere may be imagined from the fact that a sunflower has by experiment been found to emit three half-pints, and a cabbage 25 liquid ounces daily. Forests transpire millions of gallons daily, and this great transpiration of cool vapor ascending, meeting clouds charged with warmer vapor, effects precipitation, as it is called, that is to say, rain—forests being thus the cause of the descent of much more moisture than they cause to arise. These movements of heat and moisture, acting on our earth, create and nourish all vegetable life. We greatly interfere with and check their beneficial course when we deprive a land of too great a portion of its forest protection. It is not at all too much to say that now in three-fourths of settled Ontario, it is time to make the rule here as it is in Norway, that for every tree cut down two shall be planted. The woods which shelter a country are as much a means of cultivation, in their way, as are the ploughs used to turn up the soil, and the experience of other lands shows us that if the forests be destroyed, a time may come when the plough may be used in vain. I have devoted this article principally to one point in forestry, namely, the desirability of so sheltering fields as to prevent too rapid drying of the

soil after rain, and thus giving the crops for a longer space of time the benefit of the chief natural assistant of growth—the passage of water and the vapor of water—one downward and the other upward—through the soil. It would be very desirable that county or township authorities could move in this matter, so as to make the preservation of shelter general over considerable stretches of country. Individual efforts are very beneficial, but general ones would be so in a much greater proportion. I should be glad to receive and embody in the next forestry report any suggestions as to how this could be practically set about.

Another point may valuably here be noticed. As far as a pretty extended observations, field by field, can inform me, I have found that all grass crops are benefited by shelter very greatly indeed; so is fall wheat, as elsewhere enlarged upon. With other crops, such as spring wheat and barley, it is noticed that where a line of trees borders the side of the field, there will be some slowness in ripening and inferiority of grain for some few feet from the trees. This, however, seems to occur principally where the trees are close together, and the fence, also, grown up with young undergrowth. All farmers consulted agreed that with trees, say, twenty-five feet apart, which with evergreens would form a valuable wind-break, no injury whatever would occur. My own opinion is, however, that even were the wind-breaks so dense as to produce this injury for a few yards from them, the benefit to the farm in shelter from wind and shade to cattle would infinitely overpay the loss, and this is evidently the opinion of hundreds of farmers who, in our best districts, are now busily year by year planting such.

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#### FOREST RESERVATIONS.

The portion of Ontario now mostly cleared was once a forest of beech and maple, with many another tree interspersed among, resting on soil perhaps unequalled for richness and strength. North of this was still forest, but of pine, of hemlock, or inferior hardwood here and there, on a granite basis, but its soil not at all, except in rarely occurring patches, the equal of the first, which rested on limestone rock. All through this surrounding and inferior forest the lumberman found steady work and pine in plenty, but with him every where the settler also strove to occupy a land not at all so well fitted for agricultural toil. Here and there is a spot propitious to his wish. But over a great part of the area he can but raise a few crops, sell the hay to the lumberman for a year or two more and leave. The fact is, much of this belt should perpetually remain in timber. But, searching for good land, the squatter wanders over it at his will, little and useless clearings are made here and there, and fires, spreading from them, do incalculable damage. It is time Ontario said to the settler, "There is much of my territory in which you are not wanted; where it is alike my loss and yours to go." It is time we understood that the cry, "Clear the forest; make the woodland into farms," has no application to the great, stony, granitic, pine-covered belt which hems our more fertile region. That is for forest, in forest for ever it should remain. It is the source of the rivers which feed our land; it attracts the rain-cloud and conserves the water-spring. It is now time that we began to make large provision to maintain a forest forever to the north. We have done enough, and too much, to dry up Ontario by clearing land in her central portions; let us not add to it the evil of ruining our rivers at their source. What is desirable to be done now is to map out large reservations, and to tell the settler that here he must not come. What welcome would a settler meet with if he ventured into the carefully preserved forest land of Europe? He would be told that a certain amount of

forest was necessary, that the rest of the land might yield returns to the plough. That amount, judging by the increasing drouth, we have fully cleared in Ontario south of Nipissing. It is now time to make forest reservations, and this article will attempt to describe more particularly their necessity and position. More, perhaps, than is advocated here should be kept sacred from the axe. But a commencement must be made, and at the least, the whole portion here recommended should be rigidly and at once set aside.

Forest reservations are of two classes: one small and of merely local benefit, the other large and of much more general value.

The first should be fostered everywhere over the land. Wherever an elevated piece of ground exists, sloping down in a long extent of cultivated land, its summit should by all means be in forest, and that for three principal reasons, namely:—

1. It will attract, or more properly, it will occasion, rain when most needed. Ranges of hills themselves, according to their height, occasion rain, because currents of moist air passing over them are elevated to a cooler atmosphere, which at once causes precipitation, as it is called, or rain. If these heights are crowned with trees, of course the air currents are elevated to a greater height, and the effect is, therefore, greater, an effect which the cool, moist air ascending from forests tends to increase.

2. A grove at the summit of a slope acts as a reservoir of moisture, holding the rain and melted snow. If the summit be cleared, and nothing there but a bare field, these waters will continually wash away the cultivable earth, leaving the hill-tops white and barren, and will gradually continue the same process from the summit of the hill downward to the river. This has occurred in many countries where the inhabitants were so unwise as to disforest the hill-tops, the slopes being now utterly barren and all the good soil washed into the valleys. But if the hill-tops be forested, the water, instead of rushing down the slopes to the injury of the land, will be retained for a length of time and gradually flow down the slope, as it is needed to moisten the ground, not in such volume as to carry away valuable and fertile earth, but in sufficient amount to benefit vegetation along the whole slope.

3. It will, in that elevated position, act as a very efficient wind-break, moderating for a considerable distance the force of the air currents, which, passing unchecked over the land, otherwise dry it out too rapidly. Every farm, however, should have its own wind-break.

The advantages mentioned above are, to a great extent, local. But a far greater and more general advantage can be obtained when a country is being cleared, if large parks or reservations, comprising many thousand acres, can be left at the head waters of leading rivers. This principle is now universally understood in Europe, and adopted wherever practicable, not only, as in America, by leaving portions of the original forests, but by planting many thousands of acres of young trees in these elevated situations. In the Alps and in different parts of France and Italy, this has been found the only method of preserving the mountain sides.

This larger application of the system of forest reservation, is not only of use where a large portion of territory is left in forest at the most elevated point or watershed of the country, to protect the sources of the many rivers which find their commencement there, but, also, that a large and elevated portion of the country may be left in forest for the purpose of attracting summer rain. If before Ontario was settled this principle had been acted on, and much of the country near Guelph left in forest, an infinite assistance would have been given to agriculture throughout the Ontario peninsula. That opportunity, however, has long gone by, but others still remain, one of which I am about to mention.

There is on the border of the north-west portion of settled Ontario a tract of country in which, as yet, no great amount of settlement exists. There—among a wilderness of balsam flats, miniature lakes, dark forests of frowning pine, burnt territory re-clothed with trembling aspen, here and there a hardwood stretch, here and there a beaver



meadow ; here dark rivers rolling deep beneath embowering banks ; here cataracts pouring in white foam down rocky declivities—many rivers find their source. The Muskoka, the dark Petewawa, the Madawaska, the Bonnechere—all have their sources here.

When we consider that, in the first place, this territory is the watershed and highest tableland of a portion of Ontario, millions of acres in extent, it is evident that, owing to the reasons above partly stated, its preservation in forest would be of vast importance to the Province. There is no other way in which our country, or in fact any country, can preserve its rivers.

In clearing the land, of necessity, most of the smaller creeks have been dried up, or nearly so. If now we allow it to be so completely cleared that the chief rivers also greatly lessen their summer height, the following evils will certainly occur to a very disastrous extent : The beneficial course of moisture through the land in summer will be so checked as to occasion great injury. There will be too much water in fall and spring—there will be destructive inundations—but there will be too little when it is needed for summer growth. This is not a danger of which there is no fear for a hundred years or so ; it is an immediate one. In fifty years we have lowered the water level in the land many feet ; all over the country we used to get water by digging shallow wells, now we must dig deep ones. The resultant infertility is beginning to show itself. People talk of the depreciation in the value of farm property. Do they ever notice that it is because the farms will not now yield the return they did ? I am certain that, on farms which I know, and which have not been cropped extraordinarily either, it will take two dollars to grow as much as one would have grown while still there was a fair share of woods left around.

Now, among the various means of prevention of barrenness, there is not one better than the plan of making large reservations. Other countries are, as mentioned, now that forestry knowledge is becoming general, working on this plan. In Italy, France and Germany, at immense cost, forests have been, and are being, replanted on the upper slopes. New York state is endeavoring to acquire the title to and preserve the great forests of the Adirondack mountains, cutting down of parts of which have seriously lowered the Hudson. It is time Ontario did something. She now holds the title. In ten years much of the forest I mention here may have passed into private hands and be in fields.

In a forestry report of two years back I advised, with the concurrence of many leading men of the neighborhood, that a portion of the country mentioned, comprising over twenty townships, or over a million acres, should be set aside for this purpose. Mr. Russell, of Pembroke, Crown timber agent for the region, defines it as “commencing at township No. 2 of Nipissing—Elora, Maria, Head, Rolph, Wylie and McKay, in Renfrew, extending west to townships Laurier, Paxton, Butt, Hunter and Peck, inclusive.” If settlement at any bordering point has made progress, which cannot be to any great extent, the reserving line could be drawn to suit it. Much of the region is unfit for agriculture, but would be very valuable if kept in forest. Since then, Mr. Kirkwood, of the Crown Lands Department, has published an able pamphlet, recommending a reservation in the same part of the country, but not to so great an extent, namely, about 330,000 acres. I do not consider this sufficient, as the area drained is about seven million acres for the smaller reservation proposed, and the forest so left, either the smaller or the larger, would soon be the only one left in all the older settled portion of Ontario. In a short time the general cry would be, “Why was not more taken when it was so cheap ?”

The reasons for establishing such a reservation are many, chiefly, of course, that the woodland so left would exert a controlling influence in favor of agriculture by preserving the rivers mentioned, but, besides this, it would confer on the country the inestimable benefit of retaining a forest within some reasonable distance of the cities of Ontario. It must be considered that this forest would not be merely a succession of trees. It would comprise many deep valleys, and many level table lands, many rapid rivers and many beautiful lakes. There would be forests of hardwood and forests of pine ; interminable stretches of balsam and of aspen, many a rugged precipice of granite, many a sparkling stream.

On such reservations as these, too, the experiment might be tried as to whether the expense of destroying the pine refuse might not be incurred, and yet the getting out and

sale of timber continue profitable. The solution of this problem is the key to the preservation of pine forests on this continent, and it would be a great step in advance should Ontario move successfully in the matter. No other question is as important. The pine-covered land will, in most cases, never make farms; but it could grow pine.

This portion is now being approached by railroads; in fact, the G. P. R. passes not far away. Its preservation would give to Canadians and tourists many beautiful camping grounds for summer residences, and would give, also, a place where fishing and shooting might long be had, with proper care to observe close seasons and to keep out hounds, creatures which never should be allowed, in fact, in any part of the country. By reserving this from settlement, too, the pine forests would last forever, if cared for, which is a very difficult matter where settlers are allowed on the few cultivable spots, for their fires will run, and their clearings will open wind-gaps and dry up the rest of the forest, which, though with care it may not blow down, yet will not be at all the rich, deep-rooted and lasting woodland which a large spread of forest affords. Neither do I think settlers should be allowed to cut down every hardwood forest in the country. It is nonsense to say that, in order to maintain a few families, hardwood worth millions in the future should be destroyed. There are townships in Canada which, had the wood been kept and thinned regularly instead of being cleared for farms, would have yielded sufficient to have enabled Government to maintain in idleness all their settlers this fifty years, and have given a large profit besides. Besides, the great fact is to be remembered that much of the section I speak of now is very poor land, where, if the settler goes, he goes to his loss, it may be to his ruin.

If it be not so preserved, what is the alternative? That its hardwood glades, forming but a small portion, should be cut down to make farms for a few settlers, who could, every man of them, do better elsewhere. That their cattle should wander through the whole forest, eating down every young sapling and drying up the woods, their fires running far beyond their bounds, and their clearances penetrating and causing to blow down a forest which ten times the labor of their lives could never restore.

It would not be necessary that the country should lose the benefit of the sales of its timber. When a tree, whether of pine or hardwood, has attained its fullest growth, it should be cut, and the number of trees annually attaining such growth within these limits would be large. But when the lumbermen has taken such trees he should not, as is too commonly his wont, hack and hew all around him. The refuse in such a reservation should be disposed of. There are methods whereby this—a difficult affair in ordinary lumbering—could be managed here.

It is to be remembered that in the reservation above sketched out, wherever timber limits have been placed under license, it would be advisable, if found convenient, in order to carry out the idea hinted at above, to make a change in their method of working. It might not, perhaps, be possible all at once to inaugurate the more desirable method, but the way in which such a reservation should be managed would be to a great extent as follows:—

1. Trees should only be cut when Government officials have marked them for that purpose.
2. No small trees should be unnecessarily cut down.
3. All branches, tops and rubbish, should be piled and burnt. Experiments could, as stated above, be carried out in such a park to ascertain the best method and cost of doing this. It might be that the cost and difficulty are too great; on the other hand, it may be that they are much less than has been imagined.
4. Careful watch should be kept to extinguish forest fires, and the Fire Act enforced throughout the reservation.
5. Licenses should be sold in the proper seasons for fishing, shooting and camping.
6. No cattle of any description should be allowed within the bounds, and no settlers, unless the necessary officials.
7. Men should be employed in summer in replanting any burnt land, and in winter in cutting up fallen trees.
8. Wherever it will grow, wild rice should be sown in the marshy grounds.



## MANAGEMENT OF TREES IN CITIES.

It would seem as if, even in our cities, the remembrance and habit of our backwoods methods still cling to us; and that here, in our streets and what should be our well-kept parks, we treat trees, ground, and branches, as if we were in the rush of a first clearing. We have parks, but where is the manure which should be spread over their lawns, at the proper time, and at the proper time raked away? It is thrown by tons into the hollows of our ravines. We plant young trees by the hundred, and by fifties they die. Are they ever mulched to prevent it? Not that I have seen, and I see many that are not. We trim our trees, and the rough stubs, three inches long, stand as evidence of what the pruners knew about it. Is it any wonder that many of our fine trees are beginning to die at the top, and that many of our lawns are half the time brown? But let us investigate the subject of pruning.

If this chapter could but be read by everybody in our towns who has the care of trees, and if they would but follow one simple direction, which it principally is intended to impress—a direction which proposes to them very little extra trouble—it would be of a benefit to be valued by millions of dollars. The direction has simply reference to the matter of pruning, and does not ask of you anything more than this: that when you cut off a branch, you will—that is, if you wish to benefit and not injure the tree—cut it close to the trunk of the tree, or the larger branch from which you are cutting a smaller one. If, on the other hand, you wish to poison the tree slowly, there is no better way than to leave a few short stubs. The reason of this it is proposed to explain, for the fact is that without a certain amount of knowledge about the structure, growth, and functions of a tree, one is just about as likely to be successful in tree pruning as he would be, if similarly ignorant, in watch mending.

The trunk of a tree is composed, as all are aware, of a number of tubes, through which the sap ascends from the roots, each branch having its own set of these tubes in the trunk, arising from one particular portion of the roots. What we call the sap is largely water, mingled with plant food, of which the water is the vehicle to carry it from the earth, up through the tubes of the trunk, then through those of the branches, and out to all the leaves. In the cells of these leaves it is exposed to the air, which adds to it other materials of food, and fits the whole for nourishment. The water, which carried up the food, has now done its work, and mostly passes off into the air, while the plant food is carried back into the tree, and adds to the growth of all parts—stem and branch, leaf and twig.

Of course, when we cut off a branch, we interfere with the process; but very different results follow in certain cases. If we cut a large one, say four or five inches through, off from the trunk, the sap is found to lodge in the tubes from the cut to the root, and to soften and discolour that portion of the wood. This injures it for timber, yet will not, for other purposes, much impair the tree, granted that air and water be kept out. The way to keep these out is to cut close to the tree, leaving all smooth and even with the bark. A little of the bulge at the base of the branch, but not more than a quarter of an inch, may be left, when the cut should be painted over with coal tar, to preserve it from the weather and from cracking till the bark grows over, which it will at once commence to do, and shortly cover it smoothly and completely. It should be remarked that, if we cut off a portion of a branch, that is, one or more branches from a larger branch, still leaving plenty, say half, no injury to the wood follows, for the remaining branches have the power of perfecting the surplus sap and returning the plant food.

But when a short stub is left, a very different action takes place. The bark cannot grow over it, and the checked sap within receiving, through the rotting stub, air and

water from without, decay takes place throughout the tubes from the wound to the root, and at the stub, where the process is strongest, infects the neighboring tissues and, in a few years, forms a rotten cavity deep into the tree. Yet we often see, in Toronto, when men are set to reduce the size of trees in parks or streets, a dozen such stubs left on a tree. The consequence is that the tree, which might, had the branches removed been cut closely and the wounds painted, not have been in the least injured by the operation, weakens, and stands, during life, a sickly monument of ignorant pruning. Necessarily, for at all these points decay is weakening its fibres. A few minutes' extra work would have made all the difference.

Perhaps it may be well to say a word on the method of cutting off branches. All of those under half an inch in thickness can easily be cut with a knife, always cutting upwards, and slightly lifting the branch at the same time. When, for larger branches, a saw is used, the danger being that the branch in falling may tear away the bark below the cut, it is best first to cut from under, one-third through the branch, and then finish from above. For high branches, the use of a pruning chisel, on a long handle, will save much climbing, and with care, very good work may be done with it, always remembering in shortening a branch, to make the cut so as to shed the water.

It must be remembered that the above only applies to the deciduous trees. The great family of evergreens—the pines, the firs, the cedars—are impatient of the knife, and should never be pruned. Let them, if they will, branch to the ground; it is their nature thus to protect their bark from a heat and cold to which in their native forests it is a stranger. When older, if the lower branches die, we should remove them, but while in life to cut them creates a wound from which gum exudes for years. If it be desired, however, to check the growth of an evergreen branch, it can be effectually done by pinching off an inch or two of the ends of the fresh growth for the year.

Nothing is more astonishing than to observe the manner in which many trees, especially in the parks and streets of Canadian cities, are mangled, under the idea that they are being pruned, as if the idea was that a tree was a tree, and that any difference in its appearance was of no consequence. But there are, to those who look closely—to all those, in fact, capable of taking pleasure in the beauties of nature—no two things in the world more different than a well-cared for and an ill-managed tree. The one will be sickly, jagged, torn, its bark rotting, its branches decaying at the top. The other will be upright, its branches vigorously spreading, its bark clear, bright, with every channel accurate as if fresh from the sculptor's chisel; its leaves abundant, moist, and vivid of colour. The two trees are the types of cultivated beauty and unnecessary deformity.

In streets, and in the small plantations which surround many residences, it would often be productive of a much better effect to remove a certain number of the trees altogether than to prune them. The pruning is done with the view, in streets, of clearing the roadway of obstructing branches; and in the other case, generally, to open up a view. In both cases removal and replanting would often better answer the purpose. Young and vigorous trees are always beautiful, and give, for a long period, sufficient shade; but when they grow tall and overshadow the houses, a result which is necessarily obtained by pruning their side branches, it is doubtful whether they benefit health. They certainly cause both roofs and house fronts to decay, which never creates a healthy atmosphere. Venerable trees are excellent and valuable for many purposes; but it doubtful whether, in streets, our object should not always be to keep lines of young trees, not too close to each other or the houses, and under twenty feet in height. This might readily be secured by proper forethought. In small city gardens, too, the same rule would be valuable; for though your high trees on the north are no harm to your house, yet they keep the south sun from your neighbors; while on east, south and west, your house is better of no overshadowing trees. For cities, a succession of young trees, removing them when over twenty feet high, would, it appears to me, be more beautiful and more healthy than the large trees often allowed to grow. A young tree, properly cared for, is one of the most beautiful objects in the world. But the main object of this article is to say that we should never cut branches from evergreens, and that when we take them from deciduous trees, we should leave the cut perfectly smooth and level with the bark. A stub, left on one of them, rots straight to the heart of the tree.

Let us add a word on another point. We frequently see rows of young trees, planted a year or two ago, standing, half of them dead, in dryish, half-barren ground. There is no necessity for this. If we find good soil to plant in, so much the better; but trees will grow in poor soil. If we happen to have a wet time to plant in, and some damp, showery weather for some weeks after, they are almost sure to thrive, if the proper season has been chosen, and reasonable care taken to set the roots nicely and pack the earth well around them—not as hard as if we were setting a post, though; there is a medium in all things—*est modus in rebus*, says Horace. But if there be drying weather, or if the soil be poor, there is yet a way. If we procure some cartloads of manure (there is always plenty to be had in cities) and spread about a wheelbarrow load around each tree, we shall save many saplings which otherwise would have died.

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### HOW SETTLED ONTARIO IS SPECIALLY AFFECTED BY OVER-CLEARING.

We took possession, in its forest state, of Ontario, when it was a rich and fertile land. We grew crops of wheat which were the envy of the world. For many years back this has not been the case. For years and years we have been far below the English average. Partly this is due to the fact that we do not manure as they, nor one-quarter as much; but much more to the fact that we have dried up the land by over-clearing, and allowed the flow of water over the surface to wash away much of the rich soil into the watercourses. Exactly the same course was pursued in the Eastern States, and with exactly the same result. I passed through whole districts in Massachusetts last year which a hundred years ago grew noble crops; now, they will not give a sheep pasture. Let us examine the manner in which this comes to pass, and notice the climatic influences which have to do with our soil and its fruitfulness or sterility.

Nothing is more certain than that the south-west wind is the rain-bringer here—that is, the great current of air coming from the equator, which is laden with most of the moisture the sun draws up from the vast oceans of the torrid zone. This is always passing above us, though other winds for a time may be below it, or even interspersed with it, as, in fact, the great returning polar current often is. But the south-west current is the true moisture-laden wind—laden, it will be noticed, with moisture more heated than the atmosphere through which it passes. In converting this moisture into rain, there are two chief local agencies; one, when these currents pass over mountain ranges, which condense the moisture by lifting it into a colder stratum; the other, the cool humid air always rising from bodies of forest. This has been carefully observed in India. Sir Richard Temple, Governor-General of Bombay, says:—"The average quantity of vapour must come from the ocean, and must be condensed somewhere; if it be not changed to rain as it passes over the plains, it will pass on to the mountains and be transformed there. This, indeed, is a matter of common experience; moisture-laden clouds float over the Deccan, leaving it arid, and move on to the Satpura range (wooded mountains), and being condensed there, fill the torrent beds with rain-water, which rushes into the river beds. Similarly, clouds sweep over the thirsty plains of Hindostan, and being condensed in the Himalayas, return in the form of floods in the great rivers. It is hoped that, if forest tracts were distributed over the plains, there would be cool surfaces (*i.e.*, masses of moisture arising); it attracts the clouds, and arrests them, as it were, on their way.



Thus, it is anticipated by many that the climate would be improved and the early and the later rains descend more seasonably than at present. It is remembered that, throughout the world, those regions which possess rich vegetation receive abundant rains, while those which are denuded of vegetation, are rainless. It is remarked, too, that those regions in India which ordinarily receive rain, but have been parched by a long drought, are plagued afterwards with immoderate rain." Great sums of money have been spent by the Indian government in the assistance of tree-planting and forest conservancy, the work having been commenced in 1864. Officials have been sent to Europe to examine the systems of forest management there, and a large staff has been employed in India at the work. Now that Indian wheat is competing with our own everywhere, it is time we should notice that while they are planting trees to improve their crops, we are still injuring ours by cutting them down. But what I wished to point out was, that the rain clouds pass over us here from the ocean as they do over India, and fall in rain over the distant forests to the north, and on the great height of land beyond Superior. Until we replant more largely than at present they will continue to go there.

We may improve on our ploughs and harrows; we may experiment on an infinity of manures; we may be infinitely more rapid and correct than our grandfathers in methods of sowing and reaping; but the amount of return obtained, in comparison with the labour bestowed to obtain it, certainly does not increase. Let us take up an agricultural newspaper or pamphlet of forty or fifty years ago and observe the directions given as to the best means of securing a large yield of wheat. We shall see very little stress laid on the necessity of applying manure. The land yielded a heavy crop without. Now we know that in most parts of the country, with all our modern appliances and all our scientific farming, the average of bushels raised per acre is by no means what in former days was frequently obtained.

It was, for a number of years, common to believe that this comparative deficiency was owing to over-cropping the land, and nothing was more general than to hear opinions given that throughout Ontario, or even cultivated North America, farmers were running their land to death. But one remarkable fact was observed which completely confuted the idea that the lesser fertility was altogether due to this cause. Where a piece of land had been left till lately in forest, and was then cleared, logged, burnt off, dragged in, and, in short, all the old and almost forgotten formula of the first settlers observed, the acres no longer yielded as their fellow-acres, when first cleared, had invariably done. The great wheat ears, long and bending with their plump and numerous kernels, no longer rose emulous almost to the height of the fence. The straw might be fair enough, but it was not what the former fallows had given. How was this? The land should have been just as rich. It was timbered with beech and maple, as had been many a field which lay beside. It had not certainly been over-cropped, for it never had been cropped at all. The question was very naturally asked, how this land, on which nothing but trees had ever previously been grown, had so evidently diminished in fertility?

The answer was not long to seek when the result of deforesting had been examined, as they have been of late years, by many scientific men. It was found that in those parts of North America where fertility had decreased too much of the formerly sheltering forests had been cut away; and that, as it is certainly known that many countries of the Old World have, by carelessly cutting down their forests, changed their good soil into barren land, so in the New World the same process has been energetically begun, and the symptoms of decreasing fertility have appeared precisely concurrent with its progress. The matter may be concisely stated as follows:—

1. A sufficient amount of interspersing forest in a country receives and stores up the moisture of rain and melting snow, allowing it gradually to pass away, thus preserving a proper quantity always in the ground and always in motion. The passage of water through the earth is so important to vegetation that it may almost be called the life thereof.

2. Where too much forest is gone the falling water or melting snow rushes rapidly across the land to the rivers, carrying away much good soil.

3. When showers have fallen, if the wind has too free course over the land, evaporation is too rapid, the earth is dried out in a short time and the benefit of the rain to a considerable extent lost. Woods, or even dense lines of trees, prevent this.

4. The benefit of shelter in winter by preventing the uneven drifting of snow, and otherwise assisting the crop of fall wheat, clover, etc., is very great.

5. Forests, also, by their constant transpiration of cool moisture in large quantities, do much, by their junction with the rain-bearing clouds, to attract, and in fact occasion, local rains while the woods are in leaf, which is the time when rain is needed.

The presence of interspersing forests being one of the chief conditions of fertility, and we, in Ontario, as well as those resident in the greater part of the continent east of the Mississippi, having been engaged in doing away with these conditions, insomuch that a great deal of the country is now quite denuded of trees, it follows that one of the chief reasons of the decreasing fertility, mentioned above, is fully before us. We have taken many steps towards the condition which has ruined the soil in other lands. The remedy is simple; it is to preserve what remnants of forests we can, and to plant wherever our means will allow.

The question has been asked, how is it that the great prairies of the Western States were ever fertile, while trees are said to be so necessary to fertility? This is easily answered. These prairies were, in the first place, of exceptional fertility, so far as regards the quality of the soil. It is a very deep, soft, rich loam, which, once receiving the benefit of a heavy rain, allows many days to pass before it is deprived of it by evaporation; or rather, it should be said, enjoys the benefit of the process of evaporation for many days. (For while moisture is rising to the surface, it is also softening plant food and conveying it to the roots, and it is furnishing these roots, also, with the large quantity of water all plants need as a carrying vehicle for food, and to supply the continual transpiration from the leaves.) Our soil in Ontario is not such. Take all the groves from the prairies, and denude Ontario of trees, both would, in process of time, become desert; but the prairie not till very many years after the other. For where nature has covered the earth with trees, there is always found a soil which a proportion of forest is needed to protect. It is laid down as a rule by those who have scientifically investigated the subject, that such a country, left one-fourth or one-third in wood, will always yield more than if all cleared and cropped, not to mention the certainty of ultimate barrenness in the latter case. There are also circumstances connected with the western prairies which render them dissimilar in rainfall to the rest of America. As has been frequently explained, the great source of rain is the wind from the equator, bearing the vast mass of moisture evaporated from the oceans of the torrid zone. To the south of the prairies are the great forests of the Gulf states, and all along their south-west stretches the great chain of the Rocky Mountains. These two, but especially the latter, condense immense quantities of this northward moving moisture, which falls in rain over the prairie states. Yet, notwithstanding these natural advantages, the great need of the prairie is now trees, and much planting is yearly done there.

In Ontario, where in many of the older settled parts we are reduced to ten per cent. of forest land, we are losing, year by year, the original fertility of the soil. It is full time that the people of every county and township took counsel as to the best way of retaining some forest protection. As far as retaining forests goes, there is but one way, and that is, if cattle be at all hungry—if they have not plenty of good grass outside—never let them into your bush. If they are to have forest shelter, by all means let them have it, but let the portion be fenced off from that which it is wished to preserve in good forest condition. If a piece of bush be taken while it is yet possessed of its original forest bed of deep-lying leaves and decaying twigs, and then well fenced against cattle, it will protect itself in great part, for the young trees growing around the edges, being habituated in their early years to the sun, will grow up hardy, with deep roots. These will not blow down, and they will prevent the drying winds blowing through the rest and injuring it. The forest earth will not harden, nor be nearly so likely to become grass-grown; young saplings will continually take root and spring up, and by care to cut out old trees as soon as they are fit, and a little thinning where undergrowth is too rank, a portion of forest



may be preserved which will always yield a succession of timber, valuable for many purposes, and a continual shelter to the adjacent farm lands, which shelter is twenty times as valuable. It has been common to say "We will keep this piece of bush, underbrush it, leave only good large trees, and it will be a nice pasture for the cattle." We might as well encourage the growth of a nation by killing off all the children. The forest needs its underbrush; we may thin it, though nature would have done that in time, but we must not destroy it. The small trees keep the large ones in health, and, obeying the great law of the survival of the fittest, the weakest die off, the strongest grow to full-sized trees.

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### WASTE OF YOUNG EVERGREENS.

While giving careful directions how to grow evergreens from seed, and plant and care for them till they are of size to place in their ultimate position, we should remember that there are many to be had throughout the country ready for planting for nothing, and that using such, if care be taken as regards mulching and the season of planting (for they need a little more care than trees from a nursery which have been transplanted several times), will save from five to ten years' time in the work of sheltering a farm or orchard. But let my readers who plant them, spare a wheelbarrow of manure to place round each on the surface, and some straw as well. Nothing repays care better than trees.

Many letters are received, saying, "Lines of evergreens are advocated in your reports and letters, and we like the idea, as giving protection in winter; but how are we to get them in numbers at any moderate price? As for the price when purchased, I find the best of them, which is probably the Norway spruce, several times transplanted, fifteen inches to two feet high, selling in nurseries a hundred miles from the original nurseries, at \$10 per hundred. At twenty feet apart, which will, by-and-by, give a fine wind-break, though closer would be better, \$10 will plant two thousand feet—quite a long line. But the fact is that a great many fine young evergreens, both pine and cedar, which might be of the greatest use, are always going to waste in Ontario.

As I was travelling last fall towards Sarnia I passed a field where there had previously existed a considerable growth of young pine trees, self-sown originally, and arrived at the height of from three to seven feet. It was found advisable to clear up this field, in order to make use of it for the ordinary purposes of agriculture. Some seven or eight hundred fine young trees accordingly had been grubbed up, piled in heaps, and were now being burned. This was in a district almost denuded of trees, and where the sweep of the winter wind must have been something terrible of a freezing day. If, instead of burning these, they had, at the proper season, been planted along the north fence of that and the adjoining field, many crops would have prospered to better advantage for all future years, so far as the influence of their shelter extended.

All over the country, here and there, are scattered growths of young pines and cedars, which seldom serve any good purpose, being destroyed in succession when the land is needed. If farmers living near there would plant them out as shelter belts, either on the north, west, or whatever sides of their farms are most exposed to the winds, what are now of little or no value, merely large, useless weeds in many a field which they cover, would then be of the greatest use possible, and soon grow a tall and dense wall of verdure where most needed, checking in summer the influence of swift winds, which dry the land out too rapidly; preventing the snow from uneven drifting in winter, and giving that general benefit to agriculture which is best summed up in the testimony of those who have grown such protecting lines, and state that they would not, now they have experience of their

value, be without them for a thousand dollars, and that their influence must often have doubled their crop of fall wheat, since the yield, where not so protected, has repeatedly averaged only one-half of that obtained where the protection was afforded.

We are all aware that the great difficulty in this matter is that the farmer is prone to say, "Certainly, if rows of such trees were common, if every farmer could be induced to plant a line of them, the general benefit of these numerous lines, crossing the country in close succession, so that the winds would be checked, the snow kept level, and the fields protected from drying winds in summer, over all Ontario, would no doubt be remarkable indeed. But my one poor row along the edge of my farm could exercise little influence in checking the north wind or improving the climate. Get a county, or even a township to do it, and then there would be results. But why should I alone attempt to benefit the country?" Let us point out—more, let us prove beyond peradventure, that this is all a mistake. It is true that the farmer planting a row of evergreens along the north of his farm benefits the country. There is, surely, no objection in his mind to doing that. I much mistake the feelings of most of my agricultural friends, if they would not really like to do something that would benefit everybody around, whether everybody should be grateful or not. There comes a time when, though we may have thought all was unnoticed, and that we have thrown our pearls of philanthropic effort before a race constitutionally denied the power of appreciation; there comes a time when someone speaks, and we find that all was observed; that, if it were not stated in the daily advertisement, it was given full and honest credit in the ledger of the heart. "What, you thought we did not see!"

But there is somewhat immediately gained as well. It is the general testimony that wherever those protecting rows have been planted, the farmer who has nourished them to maturity, or rather to the time when their bulk is sufficient to yield shelter, is greatly benefited in several respects. And if so now, how much more valuable will they be in coming years, when, as in too many localities the case, many relics of the primeval forest, which have as yet afforded some check to the winds, must die away, never having been properly cared for with a view to their preservation. I remember one case in point near Brampton. "I have," said a well-known cattle-breeder, "a hundred yards of hedge about twelve feet high. It keeps the snow level to my gate, and the consequence is that my path is clear enough all winter, while my neighbors have to spend about a week's work annually in digging themselves out." Wherever lines of trees have arrived at a height of thirty feet or so—if they be evergreens, for others yield little protection in winter—the crop of fall wheat and grass for twenty or thirty rods have, say many farmers, been much better, while as far as fruit is concerned, the trees thrive and yield twice as well. "I can," said one farmer, who had a good line of white pine trees, thirteen years old, along his farm edge, "now stand to cut wood in a storm with my coat off, and be comfortable; and that alone I would not lose for \$500, not to mention the good it is to the rest of the farm." One of the most successful I know of was, when planted about eight years, fifteen feet high, with a spread of eight feet at the ground, stems about six inches thick. This was of ordinary white pine, taken from pine openings, being saplings of about six feet in height, transplanted as quickly as possible after moving, and taking up as much sod and root as would well carry. Planted about the 6th or 7th of May. Not five per cent. died, and these were replaced at once. This is in Bosanquet, and is said by the owner to make always at least three degrees difference in stormy weather round his dwelling; he has, as he remarks, "to go off the farm to know how cold it is."

What would be most valuable in any movement of the sort would be the general and united action of a locality. Each owner can no doubt benefit himself by such work; but each owner would be doubly benefited if his neighbors seconded his efforts. In other words, a succession of lines of trees will have many times the beneficial effect in moderating storms, checking winds, or lessening cold that a single one can exercise. It would be well here to mention the method in which the most-successful experiment in planting of this sort I am acquainted with in Ontario was carried out, as it is the easiest, and, if the time and temperature be rightly taken advantage of, the surest of all methods.

This plantation, or rather long line of trees, was obtained by taking young pines, partly from a wood, partly from a field. They were taken about six feet in height, and

a time chosen when, early in the spring after the ground had all thawed out, one night's frost had hardened it again to the depth of over an inch. A number of men were set at the work so as to take advantage of the then state of the ground, and with sharp spades a ring was cut around each tree nine inches or more from the stem, cutting through the frozen surface and going some inches deeper. On passing the spade further under in a partly horizontal direction, the round mass of earth and roots, bound together by the frost, was easily lifted, was carried to its appointed place and planted at once, losing but little of its adhering earth in the transit. Earth was then carefully filled in wherever a gap existed, and the tree left. Nearly eight hundred trees were so planted on that occasion, and so complete was the success of the method used that scarcely a dozen trees died. When I last saw the row of trees it was nearly fifty feet in height, forming a complete natural wall around all that part of the farm, and, as a matter of course, having an extremely beneficial effect both in mitigating the severity of the cold in winter, checking drying winds in summer, and in many ways encouraging growth in the fields it sheltered.

If Ontario had, crossing the country at reasonable intervals from east to west, many successive rows of evergreens, travelling in winter would be much easier, crops be much better, and what was grown would be procured, there is good reason to believe, at a much smaller cost than at present. It is, as I commenced by pointing out, a very great loss that the numerous young evergreens now found growing wild in so many pastures (for cattle will not, as all are aware, eat them down as they do others), should not be placed where they could be of such infinite value, instead of being, as is too often the case, burned up as so much rubbish whenever the field is needed for the plough.

And, finally, speaking of cattle, we should remember the very great advantage the shelter and shade of such tree lines will be to them. North of them they will throw a shade which will weaken grain for a few yards, but it will improve grass, and give a splendid resting place for cattle. We are, in future, in Ontario, to depend less on wheat, more on grass-growing and cattle-raising. For these last purposes, we can hardly have too many lines of trees.

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#### THE PLANTATIONS ADVISABLE ON ONTARIO FARMS.

It will be noticed in another part of the report that many farmers and others have within the past year or two commenced to establish small plantations, ranging from a few hundred trees in a treble or quadruple line to a good few thousand. By next year, I trust to be able to visit and report on a number of these. The first year, as my readers are probably aware, a sapling is tolerably likely to grow; it is the second year which decides whether or no good root has been taken, so that it is as well to allow a little time to pass before judging of the state of these. What is satisfactory is to note that they have been started to a certain extent. Where the practice of planting once takes footing, many are certain to follow the example set. On many a piece of ground, now worthless, might be standing, in a few years, a compact grove of elm, hickory, ash, or such trees, from which every year after might well be culled a hundred dollars worth of timber. But this is not got by planting some straggling trees; they must be properly set and cared for. But for those who will do it, the money will be surer than wheat or cattle growing, if the statements of those who buy much lumber of this class yearly are to be believed.

The reasons, both climatic and economic, for planting such groves, are also elsewhere set forth; but a few words may be said here as to the part of the farm they should occupy, supposing the piece of ground to be planted to form a portion of one. In a late



examination, described elsewhere, of a considerable section of Ontario territory, the opinion was expressed by many that on a great number of farms there would exist some acres of ground worthless, or comparatively so, for other purposes, which might well be devoted for tree-planting.

It may be that there is a steep hillside. I could point out a hundred farms where there is such a hillside channelled with the washing rain, and white and poor from loss of vegetable matter. Now, when the land was forested, this was deep with rich humus, from which sprang upwards trees by the thousand, many of them gigantic in their growth. Centuries passed, the storms came and the rain poured down, but they never washed the rich earth from the hillside. The interlacing roots—the depth of vegetable matter absorbed it sponge-like, held it by the ton weight—on large surfaces by the hundred ton weight—and kept it till, when the dry valley needed it, it came forth gradually, from a million underground channels, to refresh the thirsty soil. Now, it is different—the trees on the hillside are gone, storms come, rain falls, but it rushes at once to the creek, the creek to the river, the river to the lake, the lake to the ocean. Then in the dry time which follows, the level land fails to receive the benefit it once had from the forested hill, the crop is poor, next year it may be poorer. Why will we fight against Nature? If, instead, we would but follow her methods, she would be our friend. We force her to be our enemy.

But now, as I said, this hillside—it might be said these thousand hillsides—are bare, barren, absolutely worthless. There is scarcely pasture there for a rabbit. Perhaps more—perhaps one or two sheep might occasionally pick a bit. Perhaps in the year a couple of dollars worth of mutton might be credited to the hill. That is all. Well, if by tree planting matters can be improved, we must cover the whole face of this hill with young trees, planting them far closer than we wish there ultimately to remain. Our object is now, first, not to grow trees, our object is to cover all this parched hillside from the sun's rays by the spreading leaves of little saplings, planted everywhere over the surface; second, to check the wasting away of the soil by interweaving all through and over it many millions of little roots. This can be done by getting ready all our miniature trees by some cool or damp day in spring or fall, if we are trying deciduous trees, or the beginning of June or August if evergreens, and going over the whole slope with spade or fork. Perhaps the digging-fork is as good as any, but that depends on the state of the ground. Here I should like to mention it to those who may not know it that if you are digging in sticky ground, and your spade keeps getting covered with adhesive clay, if by any means you can have a pail of water near to plunge the spade into now and then it will greatly lighten the labour. Of course, I am now speaking of a hillside too steep to be ploughed. Well, all over this, as close as we can afford, we plant our small trees; and when the leaves are out, if we have luck, this whole hillside will be shaded and our young roots will take well underneath. Then as they grow and clog one another we should be at hand to take out those which are too many, taking them out, in fact, as fast as the leaves touch. Those we take out, being now transplanted trees, will have far better roots if they have taken well in the hillside, than forest trees, such as I am supposing we have put in, for every transplanting renders the roots more bunched and fibrous and easier to plant, rendering the tree surer to take. Then you will, of course, not throw these away. If there be missed gaps in the hillside put them there. If not, all the better, but do not lose them; plant them somewhere else.

Now, when we get our hillside covered with a good growth of trees, two things will happen. In the first place there will be, owing to the mere presence of the trees, a moisture and richness in the adjacent land which was not before. It will grow you better and heavier grass; you may not unlikely get one and a-half or two tons to the acre instead of a half a ton, or a quarter, as I have seen many a time. Next, if there be a

slope of land below the hill—a field where you grow grain or what may be—it is certain that the moisture now detained among the tree roots will in dry weather flow to and moisten your field on the slope below. I need not say what this means. It will often double the crop.

Then, suppose, as we often see, we have a ravine or gully, an awkward place to plough, and as likely as not altogether abandoned to poor pasture and a few scraggy trees. If this be thoroughly planted with trees, in very many cases a long forgotten spring will begin to flow again from one of the banks, and in every case we shall have in valuable wood what was in very worthless grass. In many such cases, if the idea of close planting for timber be abandoned, and the trees left some dozen feet apart, we shall ultimately have water, shade, and some occasional grass for cattle, in short, a pleasant shady nook instead of a dry gully, fit for nothing but to show channelled clay, and impress the visitor or passer-by with the idea that so-and-so's a pretty "hard" farm. But even if this be the desire, let me suggest that all be closely planted at first, so that, as before mentioned, the trees may grow by the impetus of the shaded ground below them. They can always be thinned out, or, if they grow well, we can choose whether we will have close growing timbers or an open grove.

Or, say we have a field which has been cropped and re-cropped till it is hard and perhaps bakes red in the sun. This is an unpromising subject, but if it be in a situation fit to have in wood with consideration to the way the rest of your land lies, if you can afford time to summer-fallow this field, and in fall or spring, when soft, plant it thickly with young trees, ten to one they will grow and thrive. If we plant them pretty closely one way, and the other way leave room to run the cultivator between them, in a little while we shall have a quantity of valuable timber growing on many a field of the class I am thinking of, which of late, year in and year out, hardly gave in profit its taxes. And if, as often happens, this portion of land be the highest on the farm, which is likely to be the poorest, as having been washed by the rain for years, this upper portion being in wood will tend to keep moist and fertile in dry seasons the whole of the lower lying land. For as before explained, a wood on the summit retains the rain and gives it out as needed to the land below.

Or, if there be a piece of woods it is wished to preserve, which seems to be "drying out," there is no better way than, if a piece of land can be spared, to plant a broad belt of wood alongside it, which will both grow better by the shelter of the other and give it shelter in return. I know instances where farmers not owning the bush to the north and fearing its shelter might be lost to them, the owner thinking of clearing, have planted a belt of trees on their own land next the other, which are growing much better than they would in the open; while on the other hand, it is evident that the trees on the border of the old wood are doing better as well.

Wherever a creek runs thorough permanent meadows, whether the creek be perpetual or occasionally dry, much benefit may be expected to the meadow if a portion of the land highest up the bed of the stream be re-wooded. In this case those trees which love lower ground should be chosen, as the cedar, the soft maple, tamarack, black ash, box elder, etc., unless the upper part be high ground. I have no doubt, from frequent observation of the benefit of trees to adjacent grass, that twenty acres, five being thus re-wooded, would yield from the remaining fifteen very much more than the twenty had been in the habit of furnishing. Of all crops in summer, grass profits by the moisture which adjacent groves diffuse. I have seen timothy grass near woods, this year, nearly six feet in height, while out in the open, the soil being the same, it was nothing like as good either in height or weight of crop; it was not two feet high, and thin.

Many farmers are now either planting or preparing to plant broad strips of trees along whatever side of their farms they think most exposed. This is an excellent plan, for when the work is properly gone about, the portion of the field summer-fallowed or otherwise rendered mellow or workable, where necessary (for some soft lands need little preparation) a broad strip, say seven rods wide, can be planted in a short time, the young trees being procured and at hand. And if planted pretty closely, as previously recommended, they will thrive, with a little attention to stirring the soil for a year or two, beyond measure better than those standing separately. But I must caution my readers



also against another very common error. It is right to plant far too closely at first, but by no means right to leave them so. In the forest nature does the thinning by crowding out the weaker trees, but this is a slow and indiscriminate process. When the trees become too close by all means spare not to thin them out, neither neglect the proper time in which to do it. You will there, as before hinted, find plenty of young trees with excellent fibrous roots fit to plant elsewhere.

The reasons for planting, that humidity may be preserved and fertility consequently remain, are stated elsewhere. But apart from this, there is the great and certain profit which, in a few years, the timber obtained will realize. We all, or most of us, in the cleared districts of Ontario, can remember when, if we needed a stick of sixty foot rock elm or cedar for a barn sill, or a long basswood for a plate, or a number of balsam poles for rafters, we knew where to get them and generally had to pay nothing for them. Now, no matter how much we paid, in most districts we would not know where to get them at all. There are still a good many woods, but they are culled. Where could we build a ship of sound white oak now? On what lake or river? It would take, from what I have seen lately, a good deal of scraping together and culling in most parts. Where is there one of the old fashioned hickory studded woods? I know a place where I perfectly well remember choosing from half a hundred great trees which one I should chop a piece out of for an axe handle. I passed lately; the woods were gone, and the owner said he had "hearn tell there used to be slashin' good hickory on the lot, but there wasn't none now." Well, in a few years, before we can grow them, very many sorts of hardwood are going to be very scarce here. We do not feel it so acutely yet; timber has been coming in from the outlying portions of Ontario, which supplied the wants of the older counties. But in these back districts are no such stores of hardwood as once the front possessed, nor anything like them. In ten years time a certain description of hardwood will be in great demand, and will bring a high price all through Ontario, and it is this very class of timber the small plantations on farms will produce, namely, second growth wood.

The trees in the original forest, standing here and there, offer no comparison, in regard either to the amount or quality of wood to be obtained, with those in an evenly set plantation. When we plant trees so as to shade the ground, each strives to rise above the other to the sunlight, and the consequence is, that in a properly arranged grove we shall not only have a rapidity of growth we never attain in single isolated trees, but we have also an entirely differently formed class of trees, and therefore an altogether different kind of timber. In the isolated tree, or the tree in rows by the fence, or the tree which has sprung up in openings of clear ground in a forest, we have a tree inclined to branch to the ground, and to inclose its trunk in branches all the way up. Such a tree, cut down, gives timber full of knots from end to end. It is tough and durable, but that is its whole value. It is not good for fuel, for though when once sawed and split it burns well, the labour of cutting it up often comes to more than its value. It is not good for use in building or manufacture, except sometimes as a mere squared beam, for it generally is, except perhaps a short length at the butt, quite destitute of clear timber. It is the opposite of that I am about to describe, namely, trees grown in a close plantation.

Here, if properly cared for, you will have thousands of fine, straight, tall stems. At first they will have lower branches, but the shade will kill these off when small, an operation in which the owner can assist, if he has time, cutting them close to the trunk, and as is always the case, the improved progress of the tree well repays the aid art has lent it. For instance, to give an idea of the principle, I know many forests where the young trees have been given a chance, free of cattle, to grow, and here you will see trees not yet six inches through, and fifty feet high, without a branch, pressing upwards to the sunlight above. On this principle, which always operates in the same way in forest or plantation, we can raise as many groves as we choose, which, after a few years, will have no branches but those in the leaf-roof high above, all the rest will be timber. I have seen millions of trees, planted four feet apart each way, and many of them twenty-five feet or more in height and eight inches at the base, before they needed either thinning or trimming. Let it be here again explained that they will do without either; nature will thin and prune; but these plantations were miles square. On the smaller ones, here recommended, art should aid, and the trees would be much better for it.

I need not say how many trees can thence be cut. Any reader can easily imagine for himself what multitudes of tree trunks can be successively taken from a few acres managed thus, and when we remember the varied woods which can be planted and easily grown in our climate, what does not suit in one place answering well in another—the white oak, white and black ash, rock and water elm, hard and soft maple, basswood, hickory, walnut, and many others, all soon to be very valuable—many of them so already—it will be seen that the plan of giving the waste portions of the farm to trees has no unprofitable tendency. “Give me,” said the head of one large waggon-making firm in Ontario, “one farm covered with hickory from six inches up, and it would be worth more than the whole yearly crop on some of our cleared but struggling townships.”

As stated in the first part of this article, many farmers have commenced these small plantations. There should not be a farm in Ontario without a good-sized one.

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### OSIER WILLOW CULTURE.

Many inquiries have come to the Washington Forestry Department in regard to methods of osier planting, showing that this branch of forestry, applicable to many soils, seemingly simple and promising quick returns, has attracted widespread attention. That Department has, consequently, issued the following instructions, which will be found valuable here, as the osier-work industry in all its branches has of late years received a considerable impetus, and many beautiful pieces of furniture are now being made from basket-work—chairs, tables, carriage bodies, and an infinity of other useful articles being now manufactured in basket-work. In old times houses, in England and elsewhere, were largely made of the wattled willow. The ancient chronicler, Hollingshead, seems rather inclined to regret their disuse as tending to effeminacy. “When our houses were of willow,” he says, “then we had oaken men, but now that our houses be of oak, many of our men have not only become willow, but some of them altogether straw.”

It should be premised that osier willow growing for profit is not so simple or easy and inexpensive an enterprise as might at first appear. The market for the material is the first point to be considered, and, in connection with this, the kinds that will grow successfully and profitably. So far it seems that the climate of the United States, in most parts, with its long, hot summers, is not very favourable to the finer growth of the osier rods, at least not of the European kinds, which, with one exception, are pronounced unsuitable, while American willows are not yet sufficiently tested to warrant their extensive employment as osier holts.

The importation of osier rods, formerly under a duty of 30, now of 25 per cent., *ad valorem*, amounts annually to over \$50,000 in value, while that of manufactured baskets and osier ware, under a duty of formerly 35, now 30 per cent., during the last five years has averaged \$243,185. To obtain the material thus imported, which cannot be less than 10,000 tons, we might well devote 6,000 to 10,000 acres agriculturally worthless soil, if we can so secure a desirable product.

*Selection of Soil.*—To make osier holts profitable, such soils should be selected as cannot otherwise be used to advantage. Very poor soils, however, should be avoided, unless there is a good market for inferior material.

The best soil is a fresh, black sand, but even a compact, heavy loam, and rich but sour meadow land, which produces the poorest quality of grass, is always equally acceptable.

Peaty soil, if it can be covered with a layer of sand or loam (from the drain ditches), will produce a good growth. The Caspican willow will thrive on poorest sand. Planted on the embankments of brooks, ponds, ditches, the osier will secure the embankment and yield a good profit besides. Never plant on soil likely to be covered with stagnant water in summer.

By making drains in such localities, however, good crops can be procured. Localities liable to late spring frosts should be avoided.

*Cultivation of Soil.*—Plough or spade the ground sixteen to twenty inches deep; deeper, if the sub-soil brought up would improve the ground (sand or loam below peat); less deeply if the soil is shallow and the sub-soil meagre. Spading offers the opportunity of burying the weedy material more effectively. Wet ground should be formed into raised beds of from thirty to fifty feet wide, leaving two-foot ditches, by which the water is quickly drained off.

The water level should be laid at least one and a-half feet deep. In spading care should be taken to bring the surface soil under, and the sub-soil on top. By this means the roots will be benefited by the vegetable mould of the surface soil, and the sub-soil at the surface will prevent the rapid running to weeds. For spring planting the soil must be prepared in fall or early winter, so that it may be pulverized by the frosts.

*Choice of Varieties.*—Out of upwards of 251 species of willows, and their endless number of varieties and bastards, only a limited number have been found of economic value, especially for osier purposes. While for European climates the best varieties have, by long experience and careful experiment, been established, we cannot yet speak authoritatively for this country, especially about the capabilities of our native willows.

Such an authority as Dr. C. L. Anderson, of Santa Cruz, Cal., states in a letter to the Department, "Our native California willows, especially those growing here at Santa Cruz and vicinity, answer very well for all purposes. Baskets, hoops, etc., are made from all the varieties that have the habit of growing along our streams. There is a difference, however.

"*Salix laevigata*, Bebb, (no common name) and its varieties, and *Salix lasiolepis*, var. *Bigelovii*, Bebb, (no common name), seem to be preferable. On wet prairies, from Illinois and Wisconsin westward, is found plentifully a variety (*gracilis*) of this species, the twigs of which are collected near Chicago by Germans, and sold to dealers in that city.

"*Salix cordata*, var. *vestita*, Anderson (Diamond willow)—Common clear across the continent; twigs stout; suitable for the heaviest kind of basket work; bronze or yellowish green, often bright red when exposed to much sunlight; not so tough and pliant as those of *S. Sericea* and *petiolaris*.

"These all grow rapidly and hardy, and the texture is sufficiently tough. There is a variety of *Salix lasiandra* that has not been sufficiently described. The branches are long, slender and drooping, and have the appearance of the weeping willow. This variety is well adapted to economic uses."

"Prof. M. S. Bebb, of Rockford, Ill., the American authority on willows, in a lengthy letter on the subject of economically useful varieties, after reciting his failures with European species and varieties, says: "My strong conviction is that success in osier growing throughout the corn belt east of the Rocky Mountains will only be attained by making good use of the plants adapted to the climatic conditions, and even then that the product will fall below the best European in quality. *Salix purpurea* in some of its forms most highly esteemed abroad for osiers, is checked also by the midsummer conditions, but not to so great an extent as the sorts above mentioned, and one from which you particularize, viz., *Salix purpurea pyramidalis*, I should regard as a hopeful subject. Of willows indigenous east of the Mississippi River, I would name the following as perhaps the most promising kinds for future trial:

"*Salix sericea* (common eastward), a bushy shrub six to ten feet high; branches reddish green or greenish, at length olive; twigs long, slender and very tough, yet extremely brittle for an inch or two at base.

*Salix petiolaris* (common westward), near akin to the former; habit quite similar; twigs usually yellow or tinged with crimson; not so brittle at base."

From correspondence so far had with practical osier growers in the east, the species most successfully grown in the North-eastern States, and seemingly too in Georgia, is the *Salix purpurea*, commonly called the red osier; but which of the several varieties this has not yet been established, probably *pyramidalis*. The red osiers are of German origin, and are considered the most useful, making numerous pliant, thin, slender, evenly-grown rods, without branches; especially adapted for binding and wattling purposes; growing well on a moist, but also drier, sand soil, less so on compact soils, but again excellently



on mucky soils. They are least affected by heat and cold, wet and dry. But compared with other kinds grown in Europe, their yields are somewhat inferior, giving a full crop only after the third or fourth year.

Altogether, vigorous growers are to be the most recommended; yet even on the best soils, with quick growing kinds, the growth diminishes after a few years.

In the selection of species it is not to be forgotten that, while they must be adapted to climate and soil, and be good and persistent producers, the kind of material furnished by them is to be kept in view, as different species and different varieties differ in this respect.

*Planting for cuttings.*—The best time for planting is the late fall, generally the end of October. For such planting the soil should be prepared in spring or early summer and left fallow. If the spading has been done in fall or early winter, the planting should be delayed till early spring.

The growth of the cuttings is the more assured the less advanced the spring growth. To retard early growth take the cuttings before the 1st of March and lay them in water. Take cuttings only from main shoots, and only from the lower half of these, because the tops would yield too weak material. The best length for cutting is about twelve inches; on compact, moist soils a length of ten inches will suffice, while on dry sand and peat soils fourteen to sixteen inches may be taken in order to get the larger number of roots in the first season, the number of roots being to some extent dependent on the length of the cutting underground. Place cuttings in the ground so that the tops are even with the surface, but on compact and caking soil, which would hinder the buds from pushing through, leave two or three buds above ground.

After the shoot is started it is well to draw the earth up to cover entire cutting, as many dangers beset the top when left free—injuries in cutting, from drying and insects. Take care to pack the soil closely around the whole length of the cutting. The practice of placing the cutting inclined is without rational foundation. Cuttings for planting are best taken during winter, when vegetation rests, and may be taken from three, two, or even one year old wood, if of good size.

The distance at which osiers are planted varies. Two considerations must be kept in view, the possibility of cultivating and working between the rows, and the desirability of shading the ground as closely as possible, which keeps the soil moist and free from weeds, and, to some extent, from insects. A distance of twenty inches for the rows and four inches in the row answers these purposes.

*Cultivation.*—In the first year this is best delayed until the middle of June, to avoid disturbing the small rootlets. When cultivating, first mainly subdue the weeds and hill up the soil around the cuttings; second and third weedings should be in August and September. Before winter sets in the plantation should be free from weeds. In the second and third year thorough cultivation is required. The first cultivation should now be given as soon as the frost is out of the ground. All cultivation must be shallow, not more than two inches deep, so as not to injure the roots.

*Manuring.*—There is no doubt that by the use of manure or compost the yield can be largely increased; but it is mostly too expensive, as the material would have to be carried into the plantation by hand.

As to fertilizers, mucky or peaty soils should not receive an increase of nitrogenous matter, though this is desirable, however, on poor sands and meagre loams.

Phosphoric acid fertilizers improve the quality of osiers; the cheap phosphorites which are readily assimilated are particularly desirable. Potash, forming a large part of the constituents of willows, is especially effective.

Fertilizers are best applied during rainy weather and early in the season, as soon as the rods have been cut.

*Insects.*—The experience that extensive plantations of one kind increase the number of their enemies holds good for osier holts. Most of the injurious insects are beetles and their larvae. The former let themselves drop to the ground from their host as soon as this is touched. This habit allows the use of apparatus to catch the beetles in quantity, which should be done as early in spring as possible.

The application of quick-lime, of hellebore and of Paris green has been found successful by Mr. T. Gleason, an extensive osiergrower in Syracuse, N. Y.

The red osier (*Salix purpurea*) is especially liable to the attack of the gall wasp *Cecidomyia salicis*; but its spread can be avoided by cutting and burning all injected rods.

*Harvest.*—Osiers should be cut the first year, even if no valuable material can be got. If the cutting is delayed until the second year, branching takes place, and less valuable material is obtained. They should also be cut in the second and third years, but should be left uncut the fourth year to grow to hoop-poles in two to four years. If there be no sufficient market for hoop-poles the yearly cutting may be continued until the growth becomes too slim, which is generally in ten to fifteen years. Cutting of rods should be done during winter, from November 1st to March 1st; cut as near the ground as possible.

Keep the rods in running water, standing upright, four inches of the butt under water, until they peel easily.

Hand-peeled stock is preferred and brings a higher price than steam-peeled rods, the price last year was from six to eight cents per pound. In an average of five years the yield may be from 90 to 130 pounds per 100 stocks. Mr. I. C. Plant, of Macon, Ga., reports one and one-half tons from a three years' plantation, planted fifteen inches in the rows and five feet apart.

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### PRESERVATION OF BIRDS.

While engaged in proposing the preservation of trees, and desirous that every farm should have its grove for fuel and timber, and its wind-breaks for shelter, there is another point which should not be overlooked. It was formerly the mistaken idea of preserving a forest that we were to leave the large trees and cut down the undergrowth. It is now known that this is a sure way to defeat the object, and that to preserve a forest you must allow the young trees to spring up in all directions, both to keep the ground in good forest condition and to furnish the means of continuance of the wood. This, if generally done, would afford a shelter in which birds might endure our winter, and wind-breaks of evergreen would afford them an additional chance. The subject of preservation of bird and forest are so intimately connected, that a few words may well be said here thereon.

We are deeply interested in the preservation of these tenants of the air. They are sources of both pleasure and advantage. They protect our food; they please the eye; they charm the ear; they may even instruct the mind.

I need not here repeat how various wise governments, in their zeal for the preservation of some few ears of corn, some few small fruits, supposed to be feloniously appropriated by the birds, ordered the extirpation of these malefactors; and how in consequence insect plagues well-nigh stripped every ear from the fields and every leaf from their trees, till they were forced at great expense to import fresh detachments of their feathered allies. In fact the subject is better understood than it was a few years since, and that being the case, it is astonishing that so many useful birds are yearly shot.

Birds have, as I have remarked, many other claims on our consideration besides their value as insect destroyers. Their beauty, their lively movements and graceful flight, their cheering song, give additional charm to every landscape, and form one of the greatest pleasures of rural life. They are too, in their own way, preachers and moralists, whose lives deliver sermons and homilies. Their whole existence is a perpetual lesson of industry, of gratitude, of contentment. Surrounded by perils; in danger from want, from cold, from tempest, from their own natural enemies, and from those who should be their friends—and fully conscious of all these causes for fear—still, with spirit undepressed, they urge their daily labours; still their joyful carol rings boldly through the air. It is strange that, with so many claims upon our kindness and sympathy, we should find any gratification in injuring them. Why should we destroy creatures whose death can in no possible way benefit us, and whose lives constantly yield us profit and afford us pleasure?



Farmers, especially, who protect birds, may confidently expect repayment. They will return yearly in increased numbers to the very fields where they have found safety, to guard from the creeping things of the earth, from the winged plagues of the air, the growing crops of their benefactors. No creatures are more quickly sensible, more thoroughly appreciative of kindness.

There are, as we all know, certain birds which make especial war on the products of the orchard, or the young sprouts of vegetables in the garden, and others which certainly devour the seed grain. These, however, are of a few varieties, while the number of insect-eating birds is large. A pair of robins, it has been calculated by careful observers, will in a season eat 32,000 and more grubs and larvæ, besides grown insects. Nearly all the woodpeckers are constantly engaged in the pursuit of insects and their eggs. Certainly, while it is necessary to destroy the injurious birds wherever possible, it is equally advisable to refrain from injuring those which are so beneficial to the country.

Here it may be said that many authorities concur that the English sparrows should be destroyed by every means. In America much information has been obtained in the various States respecting them, and the Washington report says :

“The true name of this bird is the house sparrow. The name “English sparrow” is a misnomer, as the species is not confined to England, but is common to nearly the whole of Europe. The fact that most of these birds brought to America came from England explains the origin of the misleading name by which they are now so widely known.”

Dr. Warren, State Ornithologist of Pennsylvania, M.A., writes, “Our native birds have rapidly and steadily diminished in numbers since the sparrows came. Former plentiful residents are rare.” The birds which have suffered most it is said from the sparrows are the robin, catkin, bluebird, wren, song sparrow, chipping sparrow, yellowbird and oriole. This is the American statement; but others have been greatly lessened in number here. The swallow and the night-hawk, both insectivorous, are not as plentiful by seven-eighths; indeed it is doubtful if there is one tenth as many as formerly. The Washington ornithologist says :—“In addition to the indirect injury thus brought about by depriving our gardens and orchards of the protection afforded by our native insectivorous birds, the sparrows cause a positive and direct loss to our agricultural industries amounting to the aggregate of not less than several millions of dollars per annum. The ravages of the sparrow affect almost every crop produced by the farmer, fruit-grower and truck gardener, and extend over the entire year. Indeed, it is safe to say that it exerts a more marked effect upon the agricultural interests of the country than any other species of bird; and its unprecedented increase and spread, taken in connection with the extent of its ravages in certain districts, may be regarded with grave apprehension. In the early spring it prevents the growth of a vast quantity of fruit by eating the germs from the fruit buds of trees, bushes, and vines, of which the peach, pear, plum, cherry, apple, apricot, currant and grape suffer the most. Complaints of heavy damage done the grape crop of 1886, has reached here from twenty-five States.” In Australia, in the evidence published by the government, we read that “in the short space of ten days the sparrows took a ton, and a-half of grapes from the vineyard of John Chambers, Esq., of South Richland.”

In England it is likewise being complained of. Miss Ormerod, Entomologist to the Royal Agricultural Society of England, in her last report states that the sparrows drive off swallows and martins, thus permitting a great increase in flies and insects destructive in the orchard. Mr. Gurney, the well known British ornithologist, says, “I think they do enough harm, to warrant everybody in destroying them. One-fifth of good to four-fifths of harm is about what they do, take the country all over, though at certain times and places they do nothing but harm.”

It is evident that the regulations which are now proposed, appointing people to kill these house sparrows and making it a punishable offence to feed or encourage them, are wise provisions. The chief evil done by these birds is that, not being properly tenants of the grove themselves, they kill the birds which are; and not themselves largely insect-destroying, drive away the birds which destroy very many insects indeed. It is these last, and there are many of them, the preservation of which I would in every way advocate. If we provide shelter in the way of under-growth in our forest for these birds,

and also grown, which we should grow for other purposes, many a wind-break here and there, we shall have our roads and fields brilliant and vocal with the most beautiful and pleasing objects in animated life, the feathered songsters of the grove. As it is, partly that the sparrows have driven them away, but much more often that the farmers' sons have shot them, you might, for all the birds you see, as well travel through a desert as along many Ontario concessions.

If, when a child is young, the father point out to him the beauty and usefulness of birds, and direct him to admire their graceful movements and pleasing song, it will produce a very different effect on his mind and future character than if he is encouraged to throw stones at them. The latter course is too often followed and the results are evident. It is a common practice for the young men of many townships to hold shooting matches, in which the country is traversed by scores of guns and the prize gained by the number killed, so that all life seems utterly swept and banished from our woods and fields. In these hunts everything goes, not a squirrel or bird escapes, and I have no doubt whatever that very much of the injury committed by insects on our fields and orchards is directly owing to the vast number of woodpeckers and other well known insectivorous birds killed in these expeditions, and by single hunters afterwards, whose minds have been so trained that the death of harmless birds can afford them pleasure.

There is an excuse in older countries, where game is strictly preserved, for objections to the injury done by great numbers of birds kept in the immediate vicinity of the fields, but there is none here. The few squirrels, partridges, or pigeons now left can do but little harm, while many birds—the robin, most of the woodpeckers, and others—do a great deal of good. Nothing is more pleasing to the rightly educated mind than the observation of these, and the half companionship which, when well treated, they bestow. Let us preserve their lives; they will in return amuse and assist ours.

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### EVERGREEN HEDGES.

There is nothing so beautiful about a farm, especially in winter, as some extensive lines of evergreen hedges. It is now, indeed, the custom to substitute the open wire fence for all description of closed fences to prevent the drifting of snow. This does not, however, appear to be so much thought of in other countries, for all through Illinois, Iowa and Kansas, last year, I noticed them busily engaged in substituting the hedge for the wire fence; and, throughout the prairies the long hedge rows are now the chief relieving features of the landscape. The following statement is by Mr. Warder, the best authority on this subject:—

Beautiful hedges may be made by planting rows of almost any of the common thick-growing evergreen trees and shrubs. The Norway spruce has been applied in this way; the common cedar is very efficacious, and much used for producing a shelter-hedge, where a quick, permanent and effective wind-screen is wanted; but is liable to grow thin at the bottom. The American *arbor vite* and the hemlock are admirable where a neatly trimmed garden or lawn evergreen hedge is desired—one that can be kept within bounds.

Those who expect good crops and intend to produce them, are aware of the great importance of a thorough preparation of the soil. So with the hedge, its success will depend, in a great measure upon the manner in which the ground has been prepared for its reception. Deep ploughing and even sub-soiling has been highly recommended. In wild uncultivated lands, the sod should have been broken up some months previously, so as to become mellow, and then deeply stirred in the spring, and freshly harrowed before planting, which should be done just as the plants are ready to start.

The distance from plant to plant becomes now a matter of great importance. My cedars at two years old were set three feet apart, but so perfectly are the branches united,

it would be difficult to tell where the stems of these plants emerge from the ground, in a hedge of three years growth. I should not desire to plant the hemlock or the American *abor vita* any closer than the cedars.

*Trimming.*—The general rules, already laid down, will apply here; except that the evergreens must be treated as a completed hedge from the first. There is here no cutting down to the ground to produce lateral branches; they are already provided in abundance in the young plants. We may, after planting, remove the tops of some of the tallest, to bring all to the same level, and many gardeners using tall plants, cut-in the tops severely. The trimming must be conducted on the principles previously advocated, so as to preserve the pyramidal shape with the greatest exactness; no perpendicular walls, no flat tops in the evergreen hedge should ever be allowed; the two sides should meet in a middle line.

The cutting or clipping may be done with the garden shears, by which all protruding sprays are removed to the proper surface of the hedge; which should be kept even and regular as possible. This process must be performed from time to time during the season of growth, or at its close, more or less frequently, as the plants are young and vigorous, or older, and have reached their mature state; in the latter case, they will require very little clipping.

While pruning the hedge, care must be taken to preserve the upper line regular and even, as this will contribute to the beauty of the whole affair, and any deviations from it will sadly detract from the appearance of finish and completeness which would characterize the evergreen hedge.

James Busby, who travelled extensively in Spain and France for the sake of investigating the culture of the grape, observes that one great cause of the low state of agriculture in the former country was the want of inclosures to protect the growing crops. Vineyards and gardens alone were allowed to be inclosed. He describes the hedges of Andalusia as being made very readily by planting the prickly pear—*Cactus*—and the Alve—*Agave*. The former makes a fence in two years, which is said to last for forty years; and if cared for, cactus hedges might be perennial. He says it is not possible to imagine a more effectual fence, or one more easily planted and kept in order. The only objection is, that they sometimes occupy too much space, and that the trimmings are so tenacious of life, that they will live even if thrown together on a dry spot of ground. This difficulty could be obviated, and the land benefited by composting these trimmings with lime. The Alve hedge is also much used in Spain, but inferior to the cactus, because the plants die when they have flowered.

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#### IMPORTANCE OF A SUPPLY OF WOOD.

Nothing is more important to the people of Ontario than the continuance of a quantity of wood, grown in their own borders, sufficient to supply the demands of their own population. It is idle to rely for this on the forests in the rear. They do not contain it. There is much pine and plenty of hemlock, and many other woods, birch, for instance, in great plenty: but for fair qualities of hickory, walnut, white ash, white oak, and such, if we want them we must grow them. In this article, among other points bearing on the case, it is endeavoured to sketch out the different uses for which our great army of workmen are constantly drawing supplies from our forests.

Every one who has studied the subject, and observed how nations seem actually to have flourished or declined in proportion, as they possessed and used large areas of well-timbered land, is fully aware of the importance of this class of resource. Some, however, who have not paid much attention to the matter, are apt to believe that other materials, such as iron, are now so much used in many large structures, such as bridges, ships, and



so on, that wood will not in future be so vital a necessity in the constructive arts. I remember being told by a lumberman that it was no great matter if the forests went. "We'll find a substitute for wood," said he; "why, they're making sawdust into wood now." I did not ask him whence, if wood disappeared, he would get his sawdust.

But the fact is that, as in many other matters, the fresh material introduced only creates a greater demand for the old. When railroads were commenced, every one lamented the certain decay it would cause in horse breeding. Now we know that there are more horses bred than ever, the number superseded on the roads being more than made up by the great additional supply of these animals required in the cities and on the farms. Railroads have, indeed, made it possible for many to use coal instead of, and as cheaply as wood; but these roads themselves are vast wood consumers. Numbers of them still use wood for fuel, and even in the article of railway ties alone, North America has used, at the common rate of nearly three thousand ties a mile, four hundred million of ties, besides all the other wood required in the construction of cars and buildings, for which large amounts are required. These ties—all the 400,000,000—must be replaced every ten years, too. The amount of railroads largely increases, and that, therefore, much more wood will be yearly needed for these purposes. At present, by the calculation of Mr. Sargent, the chief authority in the States on these matters, the number of ties used each year now, in construction and repairs of railroads, is about sixty millions. Each year about ten thousand miles of new railroads are built; some years in the States there are less, but adding Canada and Mexico that will always be at least, the average. So that we may say, before long, there will be drawn from our forests—what are left of them—a hundred million of ties yearly. Now let us see how these are made. If large trees were taken—mature trees—trees which ought to be cut down, (for it is of no use to keep a tree standing when mature; it should be cut, and another, if any sort of decent forestry were maintained, should be ready to take its place), it would not be of so much consequence. But that is not the way these ties are taken.

The way is, choose a fine young tree about ten or twelve inches through, ten feet from the ground; that is from trees which twenty or thirty years ago escaped destruction by fire or browsing animals, and which if suffered to grow, would in years to come, afford immense quantities of valuable timber. How much do they afford now? Two ties each, that is generally all, for they are not even halved by the saw-mill, no; the tree is cut down, flatted with the axe on each side, cut in two lengths, the top left lying to create or help a forest fire, the two little flatted pieces of timber dragged off by the oxen, and the work is done. A fine young tree is lost; that is to say, in every year there are now thirty millions, and will soon be fifty millions of healthy, vigorous, young trees cut down and destroyed, (for we can hardly say used) for railway ties. It is a most serious drain upon our forest resources, and should cause much doubt as to the ability to supply it in the future, especially, as the same authority remarks, there are now, in every part of the country, fewer seedling trees valuable for ties than when the trees cut for this purpose first started to grow.

Let us notice the article of charcoal. A writer of eminence, Mr. Fuller, speaking of this, says: "It is only a little more than a century since coke was first employed for smelting iron ores. The introduction of this fuel to take the place of charcoal, it was thought, would save the forests of the world from destruction by the charcoal burners; yet, while it has done much towards making it possible to produce sufficient iron to meet the great and always increasing demand, it has not superseded charcoal, and there is probably more charcoal used to-day than at the time coke was first employed in a smelting furnace. Charcoal is still used in furnaces and forges, and there are several establishments in this country that use annually over five millions of bushels each, and a score of others that consume from twenty to twenty-five hundred thousand bushels."

"Notwithstanding," the same writer continues, "the number of substitutes that are employed, the demand and consumption of wood appears to increase, and to-day there is probably more wood used in making boxes of various kinds than there was in the construction of buildings of all kinds in this country seventy-five years ago. Furthermore, no kind or quality of timber appears to escape the insatiate demands of the artisan of the

period, and he not only finds ready uses for the large and the small, the hardest, toughest and most durable, but he also finds excellent use for the soft and spongy, this being preferable for grinding up into pulp for making paper."

With reference to the amount of lumber used for boxes, it is interesting to note that in certain quarters it has lately been sagely observed that there need be no such fear of the pine forests vanishing, since along the Atlantic coasts a young growth of white pine is springing up, and yielding some millions of feet per annum. Unluckily for my confidence in these reports, I have lately been through many of these seaside forests myself, and find that as fast as it grows, the whole is taken, so far, for boxes alone, the tree being cut when it will give seven or eight inches wide of boards. This is after about 30 years' growth; sometimes planted—often merely sown—on the meadow, very thin poor meadow, too, down there.

"It is idle," says the same authority, "to talk of our natural forests furnishing a supply of wood for the future use of our people. Even with the most careful management and economy in preventing waste, there must soon come a time of great scarcity of all kinds of wood. With an increase in population, there must soon follow a correspondingly increased demand, because experience has shown that whenever any other material has been substituted for wood, it merely releases a certain amount which at once finds other channels or markets. No matter in what direction we turn, the fact meets us, that the best and most reliable forests of the United States are fast disappearing, and the sooner we commence as a nation to economize in the use of wood of all kinds, and preserve the forests now existing, as well as commence planting new ones, the better it will be for the present as well as future generations."

It will be well here, if we consider in how many ways the material of our forests is being reduced. In Ontario alone, in all directions, the artisan continually despatches, so to speak, his messengers into the forest, continually draws thence heavy supplies of timber, which, considering also the fact that this is done without the slightest idea of leaving the forest in a condition to yield, in successive years, as much perpetually, may well excite the liveliest apprehensions as to our future supply of wood for innumerable purposes. In Europe, the forester cuts down his trees by the thousand, but whether of pine, spruce or hardwood, he cuts them from a forest which is definitely and decidedly planned out, so that this year a certain amount is to be cut, next year another; and all the while in other parts are other trees coming on in growth, and in readiness to fill the place, in future, of those now cut. Then, as soon as those now cut leave their place bare to the sun and sky, means are taken that either by seed or by planting young trees, new plantations will arise. But here it is, so far, but to go into the wood, cut down all trees fit for the purpose, draw away their trunks, and leave the forest, perhaps to be cleared for farms, perhaps to remain till, a few years hence, another wood-seeker shall enter and take the few valuable stems not sufficiently grown to-day. Then the forest all remains, not good for timber, of no further use to the lumberman, and in a few years the farmer will cut all down, and grow crops of grain where, with care, crops of timber far more valuable might have flourished. It is the history of many a forest in Ontario. But, generally speaking, part of the evil is thus occasioned: cattle have been let in, all the good young oaks, ashes, hickories, maples, and so on, eaten down, and when reduced by culling, there seemed little hope of good timber. But this has been urged elsewhere.

Let us here notice a few of the materials which, in Ontario, we are perpetually drawing from the forest. In oak we use white oak, when we can get it, for all ornamental church work, sills, stringers and other framework of cars, sometimes their floors; for waggons and carriages, many parts of buildings, sleigh-runners, pianos and organs. White oak would be of much more general use but for its scarcity. An inferior kind of grey oak is largely sent into market as white oak now. Red oak too, is used for many of these purposes; it is not, however, nearly so strong or durable as white. It can often be known by its porosity; you can blow through an inch of red oak, not through good white.

Maple is largely used for horse-rake axles, frames of binders, and other agricultural implements; chairs, bedsteads and an infinity of cabinet work, tool handles, buildings, and so on. The beautiful bird's eye maple is largely used for ornamental work, such as



pannelling. In furniture making, too, soft maple is largely used. This, in the old forest days, was ever the favourite wood for ox-yokes. It was soft, smooth, and galled less than any other wood the rough necks of the strong beasts that carried it, while for toughness it seemed equal to any.

The white ash is a very valuable wood in Ontario work. In carriage work it gives us tongues and neck-yokes, large, broad spokes, and other parts of carriage building. It is also admirably adapted, by its beautiful grain and great durability, for the wainscoting and general internal finishing of first-class houses. It is the best material for oars, and it is a favourite wood with coopers.

Black ash is used for the same descriptions of house work, and for another for which it is peculiarly fitted, the tops and rims of pianos. It is also used in fencing, barrel-hoops, cabinet making, and the manufacture of baskets.

The Canadian butternut is a very beautiful and durable wood, is remarkably well fitted for and much used in bank and office fittings, doors, blinds, wainscoting for highly finished houses, car building, inside finishing generally, and cabinet making.

Cherry is also largely used in Ontario for bank and office fittings, doors, blinds and wainscoting for highly finished houses, upright piano cases, tables and cabinet work. It is a favourite wood for wardrobes and for the fitting up of bath-rooms, and is frequently used in car-building, as it has an excellent appearance and is cheaper than walnut.

Cedar is procured for many purposes. We have no other wood which endures so long without rotting the contact of the ground. It is therefore much in demand for posts, and it is now becoming the fashion to smooth and carve the cedar post itself instead of casing it outwardly with pine as has long been done. It is much used as lining for wardrobes to prevent moths, in which it is generally of effective service, though the Red Florida cedar is the true one for this purpose. For boat-building too, it is largely used, as well as for railway ties and shingles.

The Canadian hemlock, in many parts of Ontario where pine is scarce, largely takes the place of that valuable wood. It is not so easily worked, the knots being very apt to spoil the edged tools of the workman, and the splinters to annoy his fingers. It checks and cracks with the sun too, far more than pine. It has its virtues, however, among which are that it is almost rat-proof and will hold a nail as perhaps no other wood will. Its bark, as well as that of the oak, is largely used for tanning.

The birch is, for much interior and ornamental work, next in value to cherry, that is to say, in bannisters, newels, rails, office fixtures and cabinet work. It has a peculiar value for the runners or slides of elevators and for veneers. The thin, perforated seats of wooden chairs are made of a treble thickness of birch curiously glued together.

Hickory is used for spokes, agricultural implements, viz., threshing machines, reapers, mowers, hay rakes, straw cutters, etc., double-trees and whiffle-trees. It is valuable for all descriptions of handles.

Shell-bark hickory is mainly used for rims and shafts for buggies, light poles, etc.

Rock elm is used for felloes, cutter-runners, much waggon and carriage work, binders and other agricultural implements, veneering chairs and barrel work. It makes excellent barn sills.

Soft Elm is of value for cutter reaves, arm pieces, toboggans, veneering, chairs and tables, and cabinet work, in which it has much taken the place of basswood.

Basswood finds a place in agricultural implements, carriage building, such as carriage bodies, panels, buggy bodies and waggon boxes; flooring and sheeting in houses, barrel work, cheese boxes, legs and lyres for pianos, furniture, common chairs and tables and many other purposes.

The uses of pine are well known. There is hardly an industry in which it is not used; in many it is the chief material. It has been said of late, referring to the probable exhaustion of this valuable wood, that the sudden stoppage of its supply would create a greater panic than the suspension of half the banks in Christendom.

Chestnut is wrought here for pianos and organs, elevator manufacturing, wainscoting and general internal furnishing, and car work. It is also valuable for posts and fencing.

Walnut is valuable in bank and office fittings, wainscoting, doors, blinds, etc., in finely finished houses; car building, panelling, elevators, cabinet work, furniture, pianos and organs. Walnut would be used for many other purposes now fulfilled by other wood, had it not, through gross recklessness, become very scarce.

Tamarac is worked in Ontario for boat and car building; and whitewood for car building, pianos and organs, furniture and carriage building, etc.

We have workmen in many thousands here, and there are such by the million in other parts of North America, busily engaged the year round in exhausting the remaining supply of these valuable woods. There are but very few engaged in planting trees to replace them. It is a reflection not often made, but perfectly well founded, that much of the increased expense of living to-day is owing to the constantly increasing price of lumber, which in different woods and grades has of late years quadrupled. There is little doubt that in twenty years all kinds will be very much enhanced in price, and some quite out of the market, being virtually exhausted. These facts point one way, the way often suggested, that we should plant more trees. There will be more money in this—more solid gains—than in anything else.

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#### SUGGESTIONS ON ENCOURAGEMENT TO TREE PLANTING.

What was noticed especially, in the tour mentioned, was that farmers, while fully admitting the value of trees, regretting that so many forests had been cleared, and remarking that the country was absolutely drying up for want of more woods, yet, when they came to speak of lines of trees on their own grounds, often seemed to grudge the little strip which, on the north or west of a windbreak, would have its crop weakened by the shade, which, for ten or twenty feet, would fall on it. It appeared as if, in too many cases, the farmer would be delighted that his neighbour should grow trees, while he himself would clear every foot, and put all in crop. It must be remarked that these were isolated instances. Many were fully aware of the advantages of trees, were planting them by the hundred, and never thought of grudging them space. But with reference to the general community, it seems that, if some inducement could be given to plant trees, it would be no more than what is, in the circumstances of the case, necessary. We are, so far, a community of tree destroyers. It is not natural that we should, all at once, change to a nation of tree planters. But time flies; we should plant now if ever. A few years and there will be hardly a stick of good, solid, young timber to be had. Therefore this suggestion is made—that young trees, of good kind and properly ready for the field, should be placed in numbers in reach of every farmer in Ontario. Thousands might not accept them, but hundreds would. We should have numerous plantations of valuable trees. That would be the main point, and the government or the parliament which secures it will have earned the gratitude, not only of Ontario, but of Canada, and for the sake of example, of all North America.

In a close examination of two sections of the country in Ontario, one north and one south, in which opinions were obtained from and the farms observed of nearly two hundred farmers, as fully reported previously in these pages, it was very evident that the cause of forestry was making progress, and exactly in proportion to, and to a great extent in consequence of, the interest taken by the press here and abroad in the matter, and the various governmental publications circulated thereon. Even in the same

township, in some cases, this was very evident, and when a section was approached where the inhabitants were less intelligent and cultivated—where, in fact, they read less—there tree planting was hardly practised or even commenced. On the other hand, where the farmer was abreast with the times, and his parlour table well supplied with books and newspapers, he had frequently already planted a large number of trees, was generally making arrangements to give his farm the benefit of complete shelter by a long row of evergreens or others, and, in many cases, was planning the formation of a broad strip of plantation along the most exposed side of his farm.

There is good reason, no doubt, to believe that the agitation on this subject has been, at least throughout Ontario, of great benefit, and is giving an impetus to tree planting which otherwise it would by no means have received, besides doing much to procure the preservation of many bodies of standing timber which would otherwise, to the great climatic and other loss of the country, probably have been cut down. A great part of the country, too, it is to be remembered, is yet in the hands of those whose life has been spent in clearing the land and getting out of the trees, and to change their efforts in a direction quite opposite is sometimes difficult, though there is many an ardent tree chopper of former days who is an enthusiastic tree-planter now. And though, in many cases, it is otherwise, yet everywhere the younger generation, now observant and often studious, and soon destined to have complete charge of affairs themselves, are likely to replace much of what their fathers destroyed, and by a better timber, since a well planted second growth will be much more permanent, and in process of time much more valuable, than the original forest.

It is evident, however, that this will, at the present rate of progress, be a work of time. Emulation will doubtless do much; the farmer who observes the progress of his neighbour's trees and their value to his farm will be incited to imitation and will probably plant largely on his own grounds. But fifteen or twenty years elapse before a windbreak is of height to be largely serviceable, and the time is too valuable—the interest at stake too large, to admit of delay being allowed, if it can possibly be avoided. A means of giving a much greater stimulus to the work has been suggested, and will now be described.

Many land owners, and of them some of the most practical tree planters in their respective townships, state that a great obstacle would be overcome if a supply of young trees were always available, it being difficult to go into a forest, though it might be full of young saplings, and procure such trees as were really valuable, and of a size and spread of root likely to live in their new surroundings. The forest tree has grown in the shade, and the hot sun of the open is not friendly to its tender bark, while, on the other hand, though it has often been remarked that they should be taken from near the outskirts of the bush, it is often a matter of considerable loss of time to procure them there, a trouble much enhanced if cattle have been allowed entrance into the woods, as they at once proceed to destroy the very class of saplings most valuable for planting. Then—and this is one of the greatest objections to the bush procured sapling—the roots are few and spreading, running far over the surface of the forest ground, so that only a small part of the root can be secured. On the contrary, the nursery-grown sapling, transplanted purposely several times, obtains each time a better and more fibrous root, so that when placed in the field success in growth is far more certain. For these reasons I have known many persons, in planting trees, rather purchase from a nursery than take such as were to be had free from the field or forest.

What is suggested is that a large public nursery should be established, where trees of all sorts should be grown from seed, transplanted frequently till good roots were secured, and then given free to those who would undertake to plant and take care of them on their farms. It would be necessary to plan this in a sheltered portion of Ontario, where easily worked soil is cheaply procurable, such as the land at the mouth of the Don, or in the districts near Niagara or Windsor. Three or four men employed during the season could grow, care for, and send away millions of trees—trees, too, which would be



all likely to grow and flourish. Those receiving the saplings would, no doubt, be glad to pay the freight, which would generally be no large amount. It is not at all doubtful that by this means, every year, large numbers of trees would be planted throughout Ontario. At present, under the tree planting Act, government and the township pay twenty-five cents bonus on each tree surviving three years. There is every reason to believe that every twenty-five cents expended under the other plan would establish fifty trees.

Under it, the great advantage gained would be as follows:—Farmers are often willing to spare land for a plantation, say a wide belt of trees, or enough to fill some spare piece of land not fit for much else. They can summer fallow this, or prepare spots in it if it be broken land, and would often do it. If they could at once procure nursery trees enough to cover this sufficiently close to keep the ground shaded, the operation would be ten to one a success. If they have to trust to the straggling rooted saplings of the wood, it is not at all so certain a one. The plan would certainly multiply many times the number of trees now planted yearly in Ontario, always supposing that men of sufficient ability managed the work.

Such nurseries are common in other countries. In Prussia, in 1884, the government distributed free 25,000,000 of seedlings. Last year Bohemia distributed nearly 5,000,000, of which about half a million were deciduous and the rest coniferous. Next year twice that number will be given away by that government. Styria is making a similar distribution. Australia has in the last few years distributed \$8,000 worth of trees, each costing about one and a-half cents. There is, probably, no other plan of assistance so cheap, nor, if properly managed, any other so effective.

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#### CONSUMPTION OF WOOD FOR RAILROAD CONSTRUCTION.

One of the chief demands now continually made on the forests, as mentioned elsewhere, is that for the ties for new railroads and the repairs of old. This demand is of the most injurious nature to a forest, as it takes the young tree, and but little of it, leaving most to rot in the woods, or excite forest fires. In no long time there will be difficulty in finding forests whence to draw these supplies. What I should like to call my readers' attention to is the fact that railroads in Kansas and elsewhere, as described fully in my last year's report, are planting miles square of young trees for this very purpose. This was begun eight years since, and they have many young trees of size for ties now. These may now be cut, not to the injury, but to the benefit of the plantation, since they have all been planted four feet apart, each way, and the intermediate trees had now better go, as they are crowding. In Ontario, there is nothing to hinder anyone, in a few years, drawing thousands of dollars from a few acres planted for this purpose with well chosen trees.

A large number of circulars have been addressed from Washington to the various railroad companies of the States, numbering nearly 300, for the purpose of ascertaining the extent to which the forests are drawn upon in the construction of the roads, the kinds of trees used for railroad ties, the duration of different kinds of timber used for this purpose, the means taken to increase their durability, and other facts relative to the subject.

Reports have been received from companies owning or managing 70,880 miles of road, or about sixty-three per cent. of the whole. Assuming the present length of railroad track to be 112,000 miles, the average distance apart at which ties are placed is three feet, requiring 2,640 ties for each mile, or for the existing length of roads 295,680,000.

The railway companies almost invariably require, in building and maintaining their tracks, young and growing trees, such as are large enough only to make one tie to each cut. Trees of this size will not average more than two cuts each; consequently the construction of our existing roads has taken 147,840,000 trees. Their wood lands, as they are, will not furnish more than 100 ties to the acre. Their roads, therefore, have taken the trees growing on 2,956,800 acres of ground, or a tract of land nearly as large as the State of Connecticut.

The average duration of ties, as given by the returns, is seven years. To maintain the roads therefore, one-seventh of the original number of ties must be supplied every year, or 42,240,000, or the product of 422,400 acres. In determining the actual demand of the railroad companies upon the forests for construction purposes no account has been made for the annual increase of the roads. It ought, also, to be considered that the roads take the trees just at the period when they are about to make their most valuable growth, as it is well known that most trees after the age of thirty years make a much greater proportionate growth from year to year than in their earlier stage, and their wood becomes also more valuable for most purposes. For instance a tree measuring sixteen inches in diameter will produce double the amount of sawed lumber that can be cut from a tree measuring twelve inches.

The annual revenue from the growth of an oak tree of the species commonly used in ship-building has been very carefully determined from the means of a great many records in France, and is as follows:

		Francs.	Centimes.
Tree 50 years old.....	per annum.	0	10
Tree 100 years old.....	do	0	80
Tree 150 years old.....	do	2	00
Tree 200 years old.....	do	4	00

The consumption of forests in railway construction is seen, therefore, to be even greater than the figures indicate, and very wasteful.

Assuming that it will usually require thirty years for trees to grow to the size requisite for furnishing ties, in order to keep up the supply for the existing roads there will be needed thirty times the area which is necessary for the supply in any particular year, or 12,672,000 acres, an area somewhat larger than that of the States of New Hampshire and Vermont.

These comparisons show in an impressive view the present demands of railroads upon the forests for their construction, but with the annual increase of the roads this demand will be increased, many of the roads also making a far greater demand upon the forests for fuel than they are for ties. The railroads of the South use wood almost wholly for this purpose. We have no statistics as yet in regard to the amount of wood thus consumed. An estimate for the single State of North Carolina puts the consumption at 250,000 cords annually. But if we take this into account and also the amount of lumber necessarily used in the construction of cars, we cannot fail to see that the railroads are making very great demands upon the forests, and that these demands are enlarging every year.

#### CULTIVATION OF TREES ON THE FARM.

In the preceding article is given the experience and method of the Hamilton amateur in raising young trees of the Norway spruce. There is no better tree for general evergreen work. In this chapter is given the method of raising from seed and planting out of all other trees, deciduous and conifer. After they are once forwarded to the stage reached in this article, that is, placed in nursery rows, future planting is easy. If the young trees, by the transplanting to the rows, have not yet obtained sufficient root to



please us, all we have to do is to transplant them once more, and that time they will greatly improve in number and strength of root fibres. Then, to plant them out, all that is necessary is to see that the place of planting is drained, that is, that you are not digging a hole to hold water, but that it will have some exit; then dig deep and wide enough, get the ground in good tilth, dig in sand, if you choose, to clay, or clay to sand, or manure to either, but do not place raw manure there; incorporate it well with the soil. Then set your tree at the height it was, what is called its collar, on a level with the earth, spread the roots and press and mix the soil with them, and cover all firmly, but not too hard. Stake if necessary. Mulch by all means; it will often make all the difference between success and failure. At first, if you have plants enough, shade all the land with your tree tops; then, in successive years, thin the trees well. This is in plantations; but if only in lines, all that can be done is to plant, mulch, and protect from cattle.

Growing our forest trees from seeds, if attention be paid to a few simple details, is as easy and certain as raising any other farm crop. In the first place all tree seeds can be sown when they mature. That is the time, namely, when they fall, that nature sows them. Taking first the principal nut-bearing trees, oaks, walnuts, butternuts, hickory, beechnuts, etc., some ripen earlier, but all may be gathered in October. In the second place the slippery elm, white elm, witch elm, corky elm, silver maple and soft maple, ripen their seed in June. In the third place, hard maple, Norway maple, box elder, plane tree, birch, basswood, locust, wild cherry, alder and mountain ash, ripen their seed in the fall. In the fourth place we will put the evergreens, that is to say, pines, spruces and cedars, which also ripen their seeds in October.

Concerning our first group, the nut-trees, leave the nuts in boxes, mixed with a little damp earth, until you are ready to plant them. If you cannot sow them in the fall, leave them out of doors where they will remain frozen, or leave them in a cellar so cool that they will not grow. The method of sowing these, and those of the third class, is as follows:—

Take a piece of good dry land, sandy loam, if possible, for this reason, that clay often bakes, and makes it very hard for the young plants to get through. If, however, a clay soil only is obtainable, sand, any sort, should be brought to cover the seed in the drills. The land should be slightly sloping to insure drainage; plough or dig it deeply and well, and harrow or rake the surface smooth. Make the drills twenty inches apart, six inches wide, and two inches deep, and sow the nuts and seeds three or four inches apart, remembering that a large nut will grow a tree no larger than a little seed, but that it needs deeper covering, say always twice the diameter of the seed. Press the earth firmly over the seed. A twenty-inch drill gives room for weeding and hoeing. Then we should cover all with some sort of litter such as straw, manure, leaves or stalks, which, when spring sets in and the young roots are about to come up, should be raked off the plants and left between the drills, if it be workable with the land in hoeing, if not have it removed. You must hoe and weed these seedlings during the summer as you would a crop of roots.

For future cultivation of this class, all fibrous-rooted trees may be left here two years, but the nut-trees being tap-rooted, must, if they grow rapidly, be taken up in a year, if not, leave them two, but never more; but after two years, at all events, they will all be ready for transplanting, the method of performing which is as follows:—

As early in the spring as the ground will allow for digging, have the seedlings dug up. They should be assorted in two sizes, the large and the small. With a sharp knife cut the leading or tap-roots back to within six inches of the collar. Do not touch the

tops at all, tie them up in convenient bunches for handling, dip the roots in a thin mud and heel in ground convenient to your work. The best soil to grow all kinds of trees in nursery rows is what is known as a sandy loam with a clay bottom. To prepare it thoroughly it should be summer-fallowed the season previous, but this is not necessary, though desirable, as any land in fair tilth will answer. Having it ploughed and harrowed, set the line parallel with the longest way of the lot, if most convenient to cultivate that way. The line set, level all inequalities of the soil with the spade under the line and pat the soil down firmly by striking with the back of the spade on the line. The next operation is to cut out the drill by striking with the edge of the spade parallel with the line run, as it were to split the line. The drill is now dug out a spade wide and the soil put neatly on the opposite bank from the line—the bottom of the drill being evened with the spade as the digger goes on digging out the drill. All is now ready for planting, and the planter, provided with a bundle of plants, stops and places a seedling neatly against the bank, placing the collar of the root evenly against its edge. Another person at the same time places a spadeful of soil with a quick turn of the spade snugly and securely against the roots of the plants. The plants want firmly treading and straightening, and the balance of the trench may be filled in and levelled off. A convenient distance for any kind of forest tree in a row would be one foot apart and the distance between rows four feet. This allows cultivation with cultivators and single plough by horse and man, and is in every way convenient for growing trees straight and in good shape. Out of these rows the trees may be transplanted at any time, spring or fall, to other places, or if the idea is to leave them there permanently they will succeed.

Now we will take class No. 2, consisting of elms and maples, ripening their seed in June. As soon as these seeds begin to fall, the main crop on the tree will be ripe enough. These trees bear great quantities of seed, and as they ripen early in summer, if the seeds be sown then they will grow in the same season, making a foot or more of growth that year. The same directions as previously given contain all that is necessary in sowing these.

The next directions to be given apply to the evergreen class. Hitherto young trees of all kinds of evergreens have been easily procurable in abundant quantities from neighboring woods and swamps. There are still great quantities to be easily secured; nursery-men and large planters have drawn their principal supplies from the woods, and as they have always been able to secure their stock without much trouble, very little attention has been paid to securing seed and growing it. The white pine ripens its seed in the fall; the cones may be gathered whenever convenient, late in the fall or through the winter; by exposing them in a warm, dry room the scales of the cones open and allow the seed to drop out. This should be gathered at once, as mice are very fond of resinous seed, and would destroy them as fast as they dropped out. A good plan to secure the seeds of spruce and pine easily is to cut the branches having the cones on, tie them up in neat bunches, cover all up in muslin and suspend from nails in a warm place, over a stove or other heating arrangement, have the mesh of the muslin small enough to retain the seed; after the seed is all out put it up in paper bags and keep in a dry place. The seed of the cedar should be sown when gathered in the fall, either in drills or broadcast in small beds enclosed with boards, covering lightly with soil in which a goodly quantity of sand is incorporated, and mulching over with leaves. In the seed bed they may be allowed to remain three years when they can be carefully transplanted to other places in nursery rows; select a damp, partly shaded spot for sowing the seed. A similar plan will answer for the pines and spruces. The most necessary element in the successful growing of evergreens is keeping the soil in a uniform state of moisture, alternate damping and drying of the soil being fatal to seedlings. Persons familiar with the country and tree growth will often have noticed the thrifty little pines, hemlocks and cedars, growing on the damp hillside generally facing the north. Here, self-sown, they rear their rich green foliage to the passing breezes and the blue skies above. A moment's reflection and study will convince any person of the proper and essential rules to be observed in growing young evergreens. They are, a uniform moisture of the soil, the earth to be of a rich, loamy nature, full of sand and leaf mould, plenty of air and partial shade. Any system

embodying the foregoing principles must be successful. Evergreens, when small, thrive when planted closely together. They thus afford protection to each other, from the density of the foliage preventing the wind from a too boisterous acquaintance, shading the soil, keeping it damp and cool. So it follows when planting in nursery rows, plant them any distance that the outer branches just touch each other, and the rows far enough apart to allow cultivation easily. As the trees continue growing in size, keep trimming them out either in the rows or by taking each alternate row out altogether. One rule to observe in the cultivation of evergreens is that they thrive best by themselves, not when planted indiscriminately among deciduous trees. They will grow on poorer and thinner soils than deciduous trees. It does not follow, however, that they require poor soils to grow in; like every other plant, they thrive in a corresponding ratio to the treatment they receive, and will grow better on good soils than on poor ones, etc.

There is another method of getting these young seedlings than growing them in Ontario, as all know, that is, of importing them from foreign growers. As my readers may wish to know the facilities for doing this at the price charged, I will furnish them with a copy of a letter from Mr. Miller, owner of the chief evergreen windbreak mentioned in these pages as existing in Markham, as to the firms from which he procured the seedlings, and the cost:—

“ MARKHAM, August 3rd, 1887.

“ DEAR SIR, —In reference to the spruce, I imported the trees from Little & Ballantyne, Carlisle, England. They were twice transplanted, and from twelve to fifteen inches in height. I think they cost there about fourteen shillings per thousand, without packing. The boxes and packing cost more than the plants. The freight from Carlisle to Liverpool generally was more than the freight from Liverpool to Toronto. I imported several times, and they cost me from \$10 to \$17 per thousand, delivered in Toronto. I had an offer from the firm of Austen & McAsten, of Glasgow, to deliver them in Toronto at twenty-eight shillings per thousand, but I never got any from them. They were willing, I may say, to send a large quantity, if ordered, at a lower rate. Trees, I may remark, should not be less than one foot in height, and should have been twice transplanted. I think that is all the information I can give, having unfortunately destroyed all my old invoices and bills which relate to this.

“ Yours truly;

“ JOHN MILLER.”

With reference to prices, trees can also be imported cheaply, perhaps not so low as this, from Douglas & Co., Waukegan, Ill., an excellent place to obtain evergreen trees. But as it is not well, if we can avoid it, to send money out of the country, I should advise all tree-needers, before importing, to consult with some Ontario nurseryman as to the price they can be furnished at here, and having been informed on the matter, take their own course as to purchasing at home or abroad. There are many reliable Ontario nurserymen, though indeed, in opposition to either importing or buying here, there are reasons why a farmer, if he can, had better grow his own.

#### A PLANTATION AT NORWOOD, COUNTY OF PETERBOROUGH.

BY T. M. GROVER.

It is gratifying to notice that throughout Ontario many farmers, since information has been published and general interest excited on the subject, are planting considerable numbers of trees. The following statement by T. M. Grover, Esq., Norwood, a gentleman who has made considerable progress in this direction with excellent results, will be



found valuable, both as giving results of experiments and showing how easily plantations may be grown, with care, even by those who have not previously given much time to such work. Mr. Grover says :—

NORWOOD, 24th September, 1887.

DEAR SIR,—In sending you a memorandum of tree planting done here, I have to acknowledge the value of your previous reports on the subject. I have been working at tree culture for about three years. The permanent plantations were laid out this spring, 1887. A little over 5,000 trees are planted, where they are to remain. About 8,000 transplanted seedlings have been put in nursery rows and nearly as many more from seed are growing, some of which have overtaken in size the last year's seedling of the same species. I am carefully collecting tree seeds from every forest I visit and find a new interest in every tree that in former years I never noticed. Tree planting has been all done in the spring. I have selected black ash, soft maple and sugar maple for moving from the forest this fall.

Probably you do not hear your letters to the papers spoken of. I hear many persons who do not own a foot of land, but who read the letters, speak of trees and the information you give them. I find your list of trees in the report for 1885 a valuable reference in all cases of doubt, and on many points I had little other instruction. Beginning, as I did, to teach myself, and I feel sure if I had told everybody who speaks of trees that they could get such a report, you would have plenty of applications for them. Everyone has an opinion on trees, and since I have learned a little about the subject, I find most farmers have entirely mistaken ideas about their growth and culture, but all willing to learn and quite surprised when I tell them the possibilities. I intend to apply myself to the practical point of the subject and keep on till I can show a visible result, as well as instruct myself in the theory and principles of forestry.

From the amount of tree seed I am collecting, etc., I will have something to show in the way of arboriculture another year and shall be glad to show it to you.

I am, sir, yours truly,

T. M. GROVER.

The forest experiments here were begun with the distinct object of forming a permanent plantation of trees in blocks at even intervals, to be cared for during the first years and protected for the sake of the timber, regarding the money value of the wood, as well the advantage of the grove in the mean time. As a protection to the farm lands the lots were selected on the west side of fields, and to keep the work in view for observation and experiment, it was not convenient to plant the whole in one block, as the west side of the property was broken by the park lots of the town.

The result, though not so conspicuous as a belt of young timber would be on the side of a large farm, is so interesting, and promises such success, that only full information on the subject of Forestry can be necessary to excite the serious interest of all occupiers of land.

It would be out of place here to mention the many cases where plantations would be of profit to owners—the lands suitable, the possible or certain value of the produce, the easy growth of trees and seeds, the various native and foreign trees and their peculiarities, the advantages to climate, soil and crops, or to recite the history of known plantations in other countries. But the management of a small plantation will be in itself a lesson on the whole subject, and there will not be wanting full information for zealous foresters; and like any other scientific subject, more study leads to greater interest.

#### THE TREES.

Without previous acquaintance with the trade in nursery stock, the chief difficulty was to find a dealer. Forest trees can be got easily, but no one here had ever put any in cultivated ground and no idea of the expense could be formed. Some workmen had

formerly put out maple and spruce at 25 cents each. Certain nurserymen and tree peddlers had sold ornamental trees at 50 cents to \$1.00 each, and, being generally put on lawns in the sod, few succeeded. The trees here were selected more by prejudice than by special knowledge, and without experience in importing trees there was little to guide in the time to order or the kinds or the state in which they would reach the field. But trees are of great vitality, and although they don't look or act as one expects, a little care will bring them at last into good order.

In this lot were some transplanted white ash which seemed so dry and dead that every farmer who saw them pronounced that they could not grow: were dead in fact before they left the nursery. They looked dead, but they came on slowly, and some which were cut down low while despaired of, put forth such a growth of leaves and shoots that it was evidently a mistake to cut them down. In fact a live tree may not show much sign of life till near the end of the season, but when carefully tended may do well. All large planters in the United States tell us that with care any young trees may be moved without five per cent. of loss.

The following list shows what was done with native trees :—

Native Trees.	Percentage living.	Greatest Growth.
Sugar maple . . . . .	90	1 foot.
Soft maple . . . . .	94	Small growth.
Basswood . . . . .	90	Slight.
Black cherry . . . . .	75	20 inches.
Elm . . . . .	95	1 foot.
Black ash . . . . .	95	Slight.
White ash . . . . .	all	1 foot.
White oak . . . . .	..	Little growth, but live well.
Black oak . . . . .	nearly all	
Butternut . . . . .		
Mountain ash . . . . .		
Bitter nut (long tap roots) . . . . .	50	
Spruce . . . . .	95	1 foot.
White cedar . . . . .	80	9 inches.
Tamarac . . . . .	85	Slight.

In this locality maples are easily got of any size and easily moved; the maple seems to resist the browsing cattle (the greatest enemy of our woods) or to start up again better than other small trees.

It has always been difficult to find small basswood, chiefly because it is first taken by the cattle, but in a bush where cattle do not enter, basswood growing in single trees of all sizes will be found as well as a good variety of other native trees. In about half an acre of unbroken land, in a corner of a field, 150 good basswoods were found from one foot to six feet, and safely moved. Spruce, tamarac and cedar may be successfully taken from a wet marsh, where small trees only are left and the surface grown to a sod and in the open sun. The roots do not go below the sod and moss, and generally all will come away in a mass, and the trees are little checked by moving to dry ground; the roots of evergreens, as well as other trees on high ground, extend to a considerable depth, and are much more trouble to move successfully.

#### A MAPLE FOREST.

On an acre of good land it will be easy to raise 680 maple trees. Such a plot has been laid out here; 300 or 400 of the trees, about eight feet high, were planted early in May, eight feet apart. Nearly all were cultivated with corn and doing well. The ground at one end was sown with oats, and the trees not cultivated, and these have not done nearly so well, one-third being already dead.

The grove will be extended to one acre this fall, with trees of two or three feet in height, and it is generally expected these will overtake the larger trees. It is in a con-



spicuous place near the town, and the expense of an experiment like this is little, and not beyond the means of every farmer. Any one can see the good likely to come of it. The timber would be of good size for fire-wood before the remaining bush on ordinary farms is used up, and here where the value of maple sugar is not forgotten, 600 trees on an acre would be worth saving for sugar-making alone.

#### A MIXED LOT.

A lot of two acres has been planted with a variety of trees (native and imported). At intervals of eight feet were put white ash, black cherry, walnut, catalpa, sugar maple, basswood and black ash of three to five feet in height; then the lot was filled to spaces of four feet with ash-leaved maple. The land was good, well cultivated, and all have made good growth, some at one end stood in a low moist spot, and there the trees have grown very much more rapidly. The west side of the lot is filled close with spruce and cedar, and being west of the buildings is intended as a shelter belt as well as forest.

A further lot of four acres is laid out to be planted with white ash, walnut and locust, in separate sections. The trees for this are still in nursery rows.

#### IMPORTED TREES.

The list following gives the experience of the last three years :—

	Percentage living.	Best growth.
Black walnut .....	98	2 feet on a three-year-old.
White ash .....	..	2 feet 3 inches.
American elm .....	65	3 feet.
Ash-leaf maple .....	98	3 feet 6 inches.
Catalpa .....	97	16 inches.
Sycamore .....	60	14 inches.
Silver maple .....	98	2 feet.
Kentucky coffee tree .....	90	1 foot.
Norway spruce .....	90	8 inches.
Larch .....	..	All failed at the start.
Russian mulberry .....	..	Not hardy.

The last Report of the Agricultural College tells us, and the experience here is that it is not safe to cultivate trees after 15th July. The frost of 8th September has killed the upper or last grown leaves of walnut, catalpa, mulberry and chestnut—all due to a late hoeing, which induces a new growth not hardening enough to stand the winter.

Most varieties of seedling trees can be bought at the nursery cheaper than searched for in the forest, unless very convenient. Another advantage is in getting them all of one size and style, and the risk in moving is about equal.

There is the question of hardiness in our climate to be considered in all importations, and without longer experience it is hardly safe to try new varieties to a great extent. The walnut has been considered doubtful by many in eastern Ontario, so that the success of the large plantation from twenty-five bushels of nuts in Québec, is of importance. Tree pedlars have sold plenty of mulberry and chestnut, which they must have known were not hardy here. The catalpa speciosa planted here this year are experimental, for although raised at Campbellford, fifteen miles from this, their hardiness is not assured. They have, to some extent, succeeded in Quebec, and would seem safe here,—a vigorous, showy and profitable tree worth trying. The most interesting and satisfactory tree is the black walnut, and all appearances of it agrees with the success in the Western States. It has a large, soft root and is easily grown in any ground; no frost appears to hurt it except in very wet ground.

The white ash seedling is very easily planted, and of sure and rapid growth, perfectly hardy and of known value and success in plantations; the walnut and ash will always be the most valuable trees in this climate.

A large lot of the imported trees were put in nursery rows, about two feet apart and thoroughly cultivated. It is easier and better than to trust a small seedling in its place in a large plantation, and another transplanting will do no harm, and sizes then can be well assorted. Here seedlings are being provided for about twelve acres of timber, to be placed as soon as the trees appear strong enough.

TREE SEEDS.

Most of the nurseries in Canada have given up planting tree seed, and buy seedlings in the United States, Britain or France, where advantages of climate enable nurserymen to sell at very low prices, by the thousand or million.

There is no trouble, however, with any tree seed; they are as easily raised as any vegetable; but it is not advisable for any one in this country to raise trees from seed, except as an experiment.

This list is the success here :

Seeds.	Best growth.	When planted.
Black walnut .....	14 inches	Nov. 1886.
Sweet chestnut .....	9 "	
Catalpa .....	18 "	May 5, 1887.
White ash .....	16 "	"
Yellow locust .....	6 feet 6 inches	"
Mulberry .....	12 inches	"
Soft maple .....	7 "	June 20, 1887.

Evergreens.

Pine, white .....	} Grow well, but this very dry season came up very irregularly and are practically a failure.
" Scotch .....	
" sugar .....	
" Austrian .....	
Spruce, Norway .....	
Larch .....	

LAND FOR SEED.

The earth for seed-beds should be good garden soil mixed with sand to prevent the surface hardening when watered. The seed-beds here would have been much more satisfactory, but unfortunately forest mould was used, proving very bad for drying-out, and delaying the germination of all the seeds.

Conifers in this climate require shade for the first two years; best given by a lattice of lath, close enough and boxed about to keep off birds and mice, which are very fond of the seedling evergreen. The little seedling is also easily killed by excess of dampness or drouth, and in this very dry year, with not exactly proper care, the evergreen seed-bed has not been successful; and as other climates are so much more suitable it is really better to import seedling evergreens in all cases.

FORESTS AND PLANTATIONS.

Various writers on Forestry advise the planting of forests on soils unfit for agriculture, and generally some such spot can be found on every farm—a bad hill or rough stoney spot—but to any land a ten acre block of forest on the west of the homestead would be of value as a shelter, and the better the land the better the timber. In ordinary bush, the number of good trees per acre will not average more than fifty, and many of these will not be really alive and growing more valuable. When it appears that 680 good trees can be raised on an acre, it will almost seem as if it would pay to gradually replace natural bush by a proper plantation. Even for the use of the farm, and there are so many farms that for many reasons cannot be cropped to advantage, it would be a relief to the owners if the land were employed in growing a crop requiring no further culture, and steadily improving in value.

In the vicinity of Lake Erie where walnut, chestnut, hickory, and white-wood, are in their native home and of such rapid growth, it would not be out of the way to estimate the actual cash returns of a forest as equal to any other crop. If yellow locust—equal to cedar for durability and to maple for fuel—will grow in ten years from seed to make a railway tie (and it promises that growth in this ground), if ash and hickory will yield a full crop every year after the fourth, and if all these (in coppice) will sprout from the stump and yield in future years the same timber in half the time, it may easily appear that timber will be a good crop on the best land. There are many good farms in every county in Ontario in the possession of old people, of females, of trustees and of tenants, and of which proper profitable cultivation is not possible at all times, but which would steadily increase in value if part was planted to timber, and at a future day would be of greater value than all the income that could be derived from it in the meantime.

#### FORESTRY

is a science ; we have not come to that yet. The relation of each tree to the whole forest, the shade-enduring and the light-needing, the rapid-maturing trees, the nurse trees, the short-lived trees, the study of a century of growth, survival, influence of each variety on the other, and on the soil—in fact the whole subject of National Forestry—will soon call for ardent students, and every step on the way will, we hope, be of profit and encouragement to the individual and to the country.

### CHAPTER VI.

#### WORK OF THE YEAR, AND SUGGESTIONS.

Since the publication of the last report, as will be seen by previous statements of results, examinations have been made as to the amount of firewood remaining in settled Ontario ; and into the results of the fire-ranging system lately adopted, and the method of settlement location near pine lands. A close forestry examination has been made of two townships—one north and one south—the first being elevated land, the other much lower, and one of them facing the Georgian Bay, the other Lake Ontario. Opinions of most of the farmers in these have been taken on their observations of the effects of clearing and shelter, and the apparent effects noted, as evidenced by the crops. The press has been largely used to lay the information gained previously before the country, some five or six hundred letters and articles having been printed in the various journals, while a large edition of the previous report has been carefully distributed among those likely to profit by it.

I would recommend that the plan of a forest reservation in the Nipissing territory, suggested in previous reports, be proceeded with, and that there the experiment be tried as to how far, and at what expense, it is practicable to destroy the pine refuse caused by lumbering operations. If the result proved satisfactory, regulations concerning the matter might be introduced in the sale and management of timber limits.

\* It would seem advisable, in view of the fact that many lots have been taken up and abandoned, being found unsuitable, and that the fires in clearing such have caused much damage, that no lot should in future be settled on until an official has reported that it is fit for agricultural purposes, and not dangerously near to pine woods.

It is common in Europe to distribute free of cost large quantities of young trees, generally from Government nurseries. The adoption of this practice, either by governments or counties, would be valuable here, if the expense be not thought too great. Greater attention to Forestry is undoubtedly now being given in Ontario; but this would add strength to the movement. It is suggested as the most practicable way of encouraging plantations. The Tree Planting Act aids the planting of trees in lines, thirty feet apart; but these, though valuable for shade and shelter, cannot give good, clear timber, which is only produced in plantations or forests, while to pay a bonus on the large number of trees in a plantation would necessitate too great an expense.

It would be of great advantage, if found practicable, in cases where elevated lands, in regions about to be settled, occur, that where these comprise some thousands of acres, they should be kept wooded, either by withholding them from settlement, or agreement with the settlers that the mountain portion should be kept in forest.





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## SIXTEENTH ANNUAL REPORT

OF THE

INSPECTOR OF PRISONS AND PUBLIC CHARITIES

UPON THE

ONTARIO INSTITUTION

FOR THE

Education and Instruction of the Blind,

BRANTFORD,

BEING FOR THE YEAR ENDING 30TH SEPTEMBER, 1887.

Printed by Order of the Legislative Assembly.



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INSTITUTION FOR THE EDUCATION OF THE BLIND.

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PARLIAMENT BUILDINGS,

*Toronto, October, 1887.*

*To the Honourable* SIR ALEXANDER CAMPELL, *Lieutenant-Governor of the*  
*Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:—

I beg to submit herewith the Sixteenth Annual Report upon the Ontario Institution for the Education and Instruction of the Blind, Brantford, being for the official year ending 30th September, 1887.

I have the honour to be,

Your Honour's most obedient servant.

R. CHRISTIE,  
INSPECTOR.





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ONTARIO INSTITUTION

FOR THE

EDUCATION OF THE BLIND.

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The reports of the Principal, the Trades Instructor, and Surgeon, which are herewith submitted, so fully record the history of this Institution for the past year that extended reference to the work accomplished is rendered unnecessary.

During the protracted time in which cases of diphtheria appeared in the Institution, the attention of the Official Staff was necessarily and rightly devoted to the care of the afflicted and to the carrying out of the means adopted to stay the spread of the disease. Although the circumstances were such as greatly to interfere with the ordinary routine of instruction, and training in industrial work, yet the session was not a fruitless one, and there is good evidence that substantial progress was made by many of the pupils during the term.

The faithful and energetic manner in which it was observed that nearly all of the officials discharged their duties during the prevalence of the disease, was most exemplary and will no doubt have the effect of increasing confidence in regard to the treatment and care of pupils committed to the charge of the Institution.

The following are my notes of inspection made during the year under report :—

INSPECTIONS.

Copies of my minutes are appended :—

“ I made an inspection of this Institution on the 7th June.

“ Preparations were being made on that day for the return of the pupils to their homes at the close of the session, and this occasioned a certain amount of bustle and activity : but everything was being carried on in a regular and systematic manner, without any confusion,

“ There were in attendance at the close of the session 135 pupils—80 males and 55 females—and all were in good health.

“ The usual public examinations were dispensed with this session, owing to the outbreak of diphtheria among the pupils on their re-assembling, and the routine work was much retarded during its prevalence. Notwithstanding this untoward circumstance, however, the progress of the classes was very satisfactory, their proficiency having been well tested by the officers and teachers of the Institution. This record will materially assist in the re-classification of those who may enter again next session, and will also be of value for future reference.

"Internally the building was in excellent condition, due largely to the thorough renovation in the way of painting and kalsomining which it underwent after the disappearance of the disease.

"The Engineer and his assistant have been engaged in fitting up the material for heating the sections of the building not yet supplied with appliances under the improved system, and the work is so far advanced that little will have to be done besides putting it in place, when the pupils have left the building for the vacation term. The saving to be effected in fuel, if in proportion to that already accomplished, will be very considerable, and will be greater each year than the expenditure for the work.

"The renewal of the roof, for which an appropriation has been made under the Public Works Department, will be proceeded with at an early day and will be completed before the re-assembling of the pupils on the second Wednesday in September.

"The original roof has become entirely worthless, and the present outlay is necessary to preserve the interior and walls of the centre building.

"The crops are in a promising condition. The grounds presented a neat and tidy appearance, and the premises generally were found to be in a very satisfactory state."

"I made an inspection of the Institution for the Blind on the 19th of October, and found that there were 128 pupils in attendance, 77 males and 51 females. Others who have been pupils during former sessions have again been awarded admission, and their return will make the number on the roll equal to the average of the past year.

"With one exception the pupils were all in good health, and the ailing one was not indisposed from a serious cause.

"The arrangement and classification of the pupils appeared to be very satisfactory, and made with due regard to their advancement and ability to acquire knowledge in the several branches taught in the Institution.

"The routine work of the Institution was also well systematized, and the teachers and officers generally were giving evidence of strict attention to their various duties. With such favourable conditions and good health prevailing, the hope may well be entertained that the work of the session will shew excellent results.

"The internal improvements which have been made, largely during vacation term, and rendered necessary in consequence of the prevalence of diphtheria during the former session, have added much to the appearance of the building. Every apartment has been kalsomined, painted, or varnished where required. The plumbing, also, has been refitted, and rearranged, where it was thought most necessary to secure the best sanitary conditions.

"The work of changing the system of steam-heating was found to be nearly completed, and so far as it could be tested shewed very satisfactory results. This rearrangement has been in progress for a year past with the view of securing the complete radiation of steam throughout the building at comparatively low pressure.

"The work has been wholly superintended, and largely done by the Institution Engineer, and credit is due to him for the good workmanship and success of the undertaking.

"By the reconstruction, the use of six stoves will be dispensed with, the temperature of the whole building kept uniform, and the saving in fuel in a very short time will be equal to the whole cost of material required to make the alterations. In consequence of the larger area of steam piping now used, it was

represented that another Nason steam-trap would materially add to the efficiency and economy of the system, and authority was given to purchase the required trap at a cost of \$58.

"The new slate roof which has been put on the building during the summer, under the supervision of the Public Works Department, appears to be well constructed, and is a great improvement to the building, both in appearance and safety in the event of fire.

"A new boiler at the pumping house has been put in to replace the original one, which from constant use had begun to show defects that might have rendered it unsafe at any time.

"Considerable progress has been made in getting the property lately purchased into shape, and the grounds nearest the city have also been considerably improved. The crops have been below the average of former years. The yield of potatoes, especially, shews a large reduction, in consequence of the drouth which prevailed during the summer months."

#### MAINTENANCE EXPENDITURES.

The amount expended in maintaining the Institution during the past twelve months is shown in the subjoined statement. The same information as regards the previous year is also given :—

SERVICES.	YEAR ENDING 30TH SEP- TEMBER, 1886.		YEAR ENDING 30TH SEP- TEMBER, 1887.	
	Total Ex- penditure.	Annual cost per pupil.	Total Ex- penditure.	Annual cost per pupil.
	\$ c.	\$ c.	\$ c.	\$ c.
Salaries and wages .....	15,658 56	118 63	15,848 33	119 16
Medicine and medical comforts .....	87 34	66	228 39	1 72
Butchers' meat, fish, etc. ....	2,982 06	22 59	2,773 53	20 85
Flour, bread, etc. ....	888 68	6 73	737 48	5 54
Butter and lard .....	966 13	7 32	979 98	7 37
General groceries .....	1,863 58	14 12	1,842 71	13 85
Fruit and vegetables .....	308 80	2 34	306 82	2 31
Bedding, clothing and shoes .....	660 05	5 00	510 49	3 84
Fuel .....	2,951 30	22 36	2,342 91	17 62
Light .....	963 30	7 30	1,004 55	7 55
Laundry, soap and cleaning .....	346 69	2 63	376 14	2 83
Furniture and furnishings .....	494 05	3 74	670 74	5 04
Farm, feed and fodder .....	895 86	6 79	1,028 13	7 73
Repairs and alterations .....	896 54	6 79	937 41	7 05
Advertising, printing, postage, etc. ....	675 19	5 11	739 67	5 56
Books, apparatus and appliances .....	718 32	5 44	1,040 26	7 82
Miscellaneous .....	1,218 08	9 23	1,519 80	11 43
Total .....	32,574 73	246 78	32,887 94	247 27

## PRINCIPAL'S REPORT.

ROBERT CHRISTIE ESQ.,

*Inspector of Prisons and Public Charities:*

SIR,—I have once more the honour, as Principal of this Institution, to submit my annual report for your consideration.

The enrolment of pupils during the past session showed a total of 142, or one more than in 1885-6. Of these 83 were males and 59 females.

The pupils in attendance on the 30th September, 1887, numbered 127, 5 less than at the corresponding date last year. Of these, 113—66 males and 47 females—were on the register during the session of 1886-7, leaving 29 to be accounted for as follows:—

	Males.	Females.	Total.
Graduated in Industrial Branches.....	1	3	4
“ “ Piano Tuning .....	2	0	2
Left owing to improved vision .....	1	1	2
“ “ poor health.....	0	1	1
Excluded on account of imbecility .....	3	0	3
“ “ “ physical incapacity .....	1	0	1
Died in the Institution.....	1	1	2
Removed or detained at home (no causes assigned) ..	4	2	6
Detained temporarily at home (causes explained) ...	4	3	7
Excluded for cause .....	0	1	1
Total .....	17	12	29

Of new pupils there have been admitted 9 males and 2 females, while 3 former pupils—2 males and 1 female—who were not on the register last session have been re-admitted, making 14 in all to add to the old list, and showing, as above, 127 in residence at the close of the official year. The average attendance for the late session was 133. My estimate made a year ago that, if no disturbing causes intervened, the average would approximate to 140, would undoubtedly have proved correct but for the painful epidemic visitation which unsettled all our plans and calculations and to which reference will be made further on. There is every reason to believe that, of the pupils referred to as temporarily absent six will return very shortly, which will bring up our numbers to 133, or equal to last year's average. Other new pupils will no doubt, as in past years, join us as the session advances.

The respective ages of the eleven new arrivals are as under:—

Years.	Males.	Females.	Total.
5 .....	1	0	1
6 .....	2	0	2
7 .....	1	1	2
8 .....	1	0	1
10 .....	0	1	1
11 .....	1	0	1
22 .....	0	1	1
26 .....	1	0	1
40 .....	1	0	1
Total .....	8	3	11

The boy of 5 is an intelligent little fellow, whose motherless condition appealed strongly for a liberal construction of the rules in his favour. The pupil last on the list has long passed the age at which it is usually deemed desirable even to listen to applications, but the fact that the applicant in this case had been prevented by causes for which



he was not responsible, from availing himself of an offer of admission several years earlier, gave him a claim to special consideration. An irreproachable personal character also greatly strengthened his appeal.

In the course of a few weeks our male pupil population will almost certainly number 80 and the females 53. In other words we shall have all the male pupils we can conveniently accommodate, and within 7 of the number it is possible to find room for on the female side. That there will always be a disparity in the numbers of the male and female pupils is to be expected. The chief reason for this is the greater liability to personal injuries of boys and young men. Not a few of these are compelled to resort to this Institution owing to accidents resulting from mining explosions, gun shot wounds and other casualties incidental to dangerous avocations and pursuits. The reluctance to place a female child in the care of strangers has also something to do with the difference in numbers. But parental weakness and ignorance are not exhibited alone in the case of blind female children. The Institution has now been established 15 years; it has been pretty well advertised by the agency of the press, the dispersion of ex-pupils and the personal canvass of the officers. There are not, I imagine, many cases of blindness, unless of very recent date, with which we are unacquainted. But I should to-day have to be pretty strongly urging an early extension of our buildings if all who are known to us to be eligible, and whose immediate admission would be desirable, were to respond to our invitations. It is perhaps natural that more hesitation should be felt in parting with a blind than with a seeing child, but certainly the necessity of such a step is overwhelmingly greater in the case of the former than of the latter. Some people seem to think that because a blind boy or girl, who becomes familiar by long association with home objects and surroundings, can potter about the house and premises and do a few little odd jobs here and there, all has been gained that is necessary, but that is not education nor the extent of even a blind person's usefulness. Parents who have wisely overcome all such notions and sent their children to the Institution are astonished when they visit them to see how much more can be done for them than they had ever dreamed of. To detain the blind child at home after it has attained the proper age for admission is most cruel kindness, and as unjust to the child as to society. Our pupils do not lose their fondness for home or suffer any diminution of filial affection by being placed under our care. On the contrary, they look forward to the holidays with all the more delight as a change from the routine of school life, but they return gladly when they have once learned how much happiness is to be found in the acquisition of knowledge, the association with other young people, and the enjoyment of the ample means provided for their recreation and improvement.

#### THE STAFF.

The retirement from the literary staff of Miss Mary A. Walsh, who had been nearly six years a most valued and highly esteemed officer of the Institution, created a vacancy in the department. Mr. Wickens, our senior master, having become non-resident, it has been deemed well to secure a resident male teacher in Miss Walsh's place, and Mr. Jno. D. Alexander has been appointed to that position. The resignation, from ill health of Mr. E. H. Knight, senior music teacher, after a very few months' occupancy of his situation, took place before the late session had come to an end. Mr. E. H. Williams, who, like his predecessor, is a graduate of the New England Conservatory of Music, and comes to us with the highest testimonials as to his abilities, has succeeded Mr. Knight. Miss McNish, junior music teacher, having also resigned after several years of most useful service, it has been found possible, by a re-arrangement of the classes, to maintain their efficiency without making, for the present, a fresh appointment. Miss Kate Burke, a pupil of more than ordinary ability, and whose conduct and bearing has been such as to inspire much confidence, having graduated in the literary and industrial branches, has been appointed assistant to the ladies respectively presiding over the sewing and knitting classes. The past session was one that severely taxed the energies of the whole staff to an extent far greater than is involved in the discharge of ordinary duties, and I have gratefully to acknowledge the kind assistance and support received from my colleagues during a long period of most painful and distressing responsibility.

## THE LITERARY CLASSES.

Owing to the disturbed condition of the Institution during the first half of the late session and the protracted recess from Christmas to early in February, it was not reasonable to expect that the usual standard of literary progress would have been attained when the session should have drawn to its close. Even in the same class pupils had attended for different periods, and thus were unequally matched with one another. Under these circumstances it was considered best to dispense with the usual annual examinations by specially appointed examiners. I did not recommend this course without much regret, for the visit of the gentlemen usually deputed to discharge this duty is always a pleasant episode in the session's history. And, while the examinations are only to a very limited extent competitive, and their result as to the pupils' standing is simply a factor in our general estimate, the knowledge that educational experts of such large experience are to pass critically through the classes can but have a very stimulating effect on all parties, while their suggestions, either official or informal, are always both acceptable and useful. No one can be more desirous of these annual visits being kept up than the Principal, who is properly held responsible for the general advancement and efficiency of the pupils of the Institution in literary knowledge. I regret too, that, owing to the necessity for discontinuing the examination for one session, the present report loses a feature of much interest. As a means of justly apportioning the annual prizes and deciding promotions, the classes were examined by the Principal and literary teachers, who were of course able to tell how far each class might be fairly supposed to have gone in its particular studies, and while the effects of the disturbing causes above referred to were evident in many cases, it was most gratifying to find what good use had been made, both by teachers and pupils, of the four months during which class work had been uninterrupted. I trust that the necessity for introducing the Kindergarten system for the junior pupils will have been so apparent to the official mind as to ensure its adoption before many months are over. Hitherto, while by ordinary methods the young blind child has been trained to habits of application, and in a more or less crude and accidental fashion has received primary ideas as to shape, form and utility, the teaching has been neither systematic nor scientific. What is wanted in that regard the Kindergarten provides. The infantile ideas are shaped and moulded by an exact process and objectively applied. The hands and wrists—usually the weakest portions of a blind child's physical economy—are strengthened, and a most attractive means of improvement and recreation is provided for the youthful mind. I have already brought the subject to your notice and trust that it may fully commend itself to your judgment.

## THE MUSIC CLASSES.

These classes, like those of the literary department, were sensibly affected by the same state of affairs. The ill health, too, of Mr. Knight, the senior music teacher, was an addition to the prevailing difficulties. But we were fortunate in having in our lady teachers those who were fully competent to supply all deficiencies for the time being, and, by slightly reducing the number of music lessons—but without abridging the pupil's time for practice—all were kept under instruction, and our closing concert, I think, must have convinced any one competent to judge, that the standard of efficiency had been well maintained. I must not forget, in this connection, to refer to the hearty co-operation received from our non-resident instructors in vocal music and the violin respectively, Mrs. Dr. Howson and Prof. Baker, whose pupils on all public occasions add by their efforts so much to the pleasure of our visitors and do credit to the attention bestowed upon them. For reasons similar to those mentioned in regard to the literary classes, we had no official examination of the music classes at the close of last session. The plan of inducting our senior music pupils into the art of teaching is being systematically carried on. Three male and three female pupils are regularly engaged as monitorial instructors under the direction of Mr. E. H. Williams and Miss Callaghan respectively. Our stock of pianos

is in good order, but the extreme wear and tear from constant practice tells severely upon them, and an additional instrument will be needed before another session commences.

#### THE TUNING CLASS.

The tuning class numbers 19 pupils, all but one under direct instructions from Mr. W. G. Raymond. The exception is a youth who has just joined the class and is receiving primary lessons from a senior, while two others, who attend Mr. Raymond's classes, are being helped forward in the same manner. Three young men are, this session, concluding their pianoforte tuning course. They divide between them the care of our instruments and also assist in the instruction of juniors. Reports from pupils who have graduated from this department, are on the whole very satisfactory. Those employed (four in number) by Messrs. Mason & Risch, of Toronto, are, I believe, all doing well, and others are making a good living by their independent exertions. I could desire, however, that other manufacturers than the firm mentioned should avail of our pupils' services. I can but believe that what one establishment has found profitable would be equally advantageous to others, while the young men would have the great advantage of employment under expert supervision and thus enjoy a sort of apprenticeship before going out into the world on their own account. It is well it should be understood, however, that our tuning class must be limited in numbers. The instructor attends only on two days in the week and, besides, the scope and opportunity for blind tuners to obtain a livelihood in this Province in competition with seeing rivals, are more or less contracted. For disciplinary reasons too, not easily explained to outsiders, while very apparent to the officers of the Institution, I am obliged not unfrequently to disappoint the aspirations of pupils and the wishes in some instances of their friends by declining to place lads in the tuning class. Tuning, moreover, is a business needing certain well developed faculties, and where these are deficient even the most painstaking instructions will not produce a really first-class tuner.

#### THE WILLOW SHOP.

This very interesting and important branch of instruction, has been perhaps rather less disturbed than others during the past year. Its pupils being mostly among the seniors in age, very generally escaped contagion and, encouraged by the calm and fearless example of their worthy instructor, many of them worked quietly on with little interruption. Only one full graduate was presented for outfit at the close of the session, although several are working in the advanced stages of their industrial course. Mr. Truss's report is submitted herewith:—

#### TRADE INSTRUCTOR'S REPORT.

MR. A. H. DYMOND,

*Principal.*

SIR,—I have the honour to submit my report upon the operations of the workshop during the year ending September 30th, 1886:

The session has been one of fair progress, considering the difficulties encountered and the more or less interrupted attendance of some of the pupils. The behaviour of the latter has been, during a somewhat trying time, worthy of praise and their industry as usual commendable. The following statements will show to some extent the practical nature of the instruction given:—

Sales of Manufactured articles.....	\$560 27
On hand unsold .....	75 00
Total .....	\$635 27



## PUPILS' VACATION WORK.

*(On their own account).*

T. P. earned	.....	\$31 00
A. S. "	.....	15 30
S. L. "	.....	27 00
J. S. "	.....	30 00
L. P. "	.....	25 00
F. P. "	.....	25 00
A. C. "	.....	11 00
D. P. "	.....	10 00
M. N. "	.....	25 00
S. W. "	.....	30 00
W. D. "	.....	36 00
J. W. "	.....	15 00
T. E. "	.....	25 00
Total vacation earnings	.....	\$305 30

I am, Sir,

Yours respectfully,

THOS. TRUSS,

Trade Instructor.

## THE WORK ROOM AND KNITTING ROOM.

Excellent work has been done in both these branches of industrial instruction during the past session. The pupils in the Work Room now number 34, and in the Knitting Room 44. The difference is principally owing to the number of very young pupils who can be taught to knit before they can learn to sew by hand or machine. Most of these children are also members of the Bead Work class, which is instructed by Miss Loveys, the head of the Work Room. The great variety of work turned out by hand in the Knitting Room affords much scope for the pupils' abilities, and favours greatly their chances of obtaining employment after leaving the Institution. At the same time the use of the knitting machine is not neglected, and several pupils are thoroughly expert in its management.

## THE LIBRARY.

The following books have been added to the Pupils' Library during the past year: In embossed line type—"The Pronouncer and Definer"; "David Copperfield," Dickens; "Successors of Mahomet," Irving; "The Talisman," Scott; "Physiology," Huxley; "History of Our Own Times," McCarthy; Shakspeare's "Henry V," and Woodman's "Nannette." In point print—Upton's "Standard Operas"; Miss Yonge's "History of France"; Shakspeare's "Tempest"; "Musical History" and the Book of Psalms. In both line and point—Leigh Richmond's "Dairyman's Daughter." The cost of the several portions of the Holy Scriptures in embossed type had until lately been all but prohibitory to their purchase by any considerable number of blind persons. The Bible is published by the American Bible Society in eight volumes, six for the Old and two for the New Testament. These were charged, until a few months since, at the rate of two and a-half dollars a volume, or twenty dollars for the whole Bible. It will be readily supposed, therefore, that it was with no little pleasure we received information during the last part of the late session that the Society had, by public liberality, been able to reduce the price to seventy-five cents per volume, or six dollars for the whole set. Any one volume of the Scriptures can now, therefore, be had for a sum easily commanded by most. I cannot express too strongly my sense of the obligation the blind of Canada are

under to the several American printing houses by which embossed books are issued, or to the managers for the intelligent selection of a high-toned and attractive literature suited to the wants of all classes of blind readers.

#### HEALTH.

It is painful to be obliged to report that, after many years immunity from fatal illness within the walls of the Institution, two of our pupils, one a lad of 14, the other a young woman of 22 years, were removed by death during the past session. In my supplementary report, dated 22nd October, 1886, I referred at some length to the visitation of diphtheria, which had then become fatal in one instance only. At that time we were all encouraged to believe that the trouble was over, and that the rigorous measures adopted, and apparently complete isolation secured, had arrested the spread of the disease. I also ventured the opinion, and now with even more confidence reiterate it, that the disease was imported, and had no local origin. All our consultations here, and with competent judges from elsewhere, tend to strengthen such a conclusion. This assurance has not led to any relaxation of our efforts to protect ourselves against possible causes of mischief. On the contrary, we have adopted and are still carrying out, as opportunity offers, such improvements in this direction as suggest themselves. But, when by correspondence with pupils' friends in various parts of the Province, I found an almost universal testimony to the presence of diphtheria in their respective neighbourhoods, it did not appear to me at all suprising that, in such a community as ours, re-assembling from all points, the enemy should have insinuated itself. The mysterious manner in which the disease appeared and reappeared, the different degrees of severity with which the victims were attacked, and the utter impossibility of connecting its assaults with any personal intercourse between those assailed, would afford quite a theme for speculative theories and reasoning among those who profess to a scientific knowledge of such matters. That in some shape or other the poison had been introduced into and had distributed itself throughout the building was, however, made clear to all of us. That any thorough system of purification could be carried out effectively so long as our pupil population remained at its ordinary figures, was at the same time clearly impracticable. On the other hand, to distribute arbitrarily through houses or families in all directions those who might carry the seeds of contagion with them, was not to be thought of. We therefore waited, adopting every possible means of disinfection until it appeared safe to advise the removal of all whose friends were disposed to take them home or could suitably do so. In December, about half the number in attendance consequently left us, and the work of painting, alabastining and varnishing, as well as general disinfection by other methods, at once commenced. The pupils returned on the 10th of February, and I am happy to report that the good health of the Institution during the remainder of the session was—so far as any epidemic was concerned—quite unbroken. Meantime, several modern improvements in drain ventilation and other sanitary measures claimed attention as a protective against all conceivable contingencies. Of the particular cases of diphtheria I leave Dr. Corson to speak in his report. I have in my last year's reference to this period of anxiety endeavoured to do justice to officers and others, on whom fell most heavily the burden of responsibility. It is pleasant to reflect that, at such a time, my relations with our medical attendant and his temporary associate-physician Dr. Philip, of this city, were of the most harmonious character, and to both my thanks are due for their ever ready and prompt attention. In Dr. Bryce, of the Provincial Board of Health, we had, too, a most valuable and energetic adviser. Nor must I omit to allude to the kindness displayed by the parents of pupils, whose feelings were naturally most strongly appealed to by the danger which appeared to beset their children. I believe their confidence was largely due, as well as the calmness and self-possession of the pupils themselves, to the fact that no attempt was made to withhold from either the knowledge of the actual state of affairs from day to day, whether the news conveyed was hopeful or disappointing. The boy who first showed symptoms of diphtheria and so soon succumbed to the disease, was parentless and all but friendless. The parents of the young woman claimed by death at a later period



were with us when she died, and we had the privilege of doing whatever was within our power to alleviate their grief. Their loss was not, however, without its high consolations. I must not forget to mention in this connection the self-sacrificing kindness which led our former laundress, a woman advanced in years and living in quiet comfort with her relatives, to come to us in our extremity. No one, of course, supposed she would be liable to attack, but she was prostrated by diphtheria in a most severe form, and although the complaint itself yielded to treatment her constitution never rallied, and after a lingering illness she died in the hospital of this city where she was for some weeks most kindly and carefully treated as a private patient.

#### DISCIPLINE.

It was unavoidable that, during long months of unsettlement, discipline should be, to some extent, relaxed. I had, however, no reason to believe that this led to any regrettable results. The pupils, as a rule, were well conducted and orderly in their demeanour, and only too glad when at length able to settle down to their studies with regularity and assiduity. It will be observed that one pupil is mentioned as "excluded for cause." The reasons which made her an unsuitable companion for other young girls were of a character which all judicious and thoughtful parents would appreciate, and need not be more specifically alluded to.

#### RECENT IMPROVEMENTS.

Among the most needed improvements urged in former reports was a new roof for the main building of the Institution. For years past the old sheet-iron deck roof had been a source of continual discomfort and expense. It has now been covered with a sloping slate roof, which adds much to the appearance of the structure and will, I trust, effectually prevent further trouble. In the interior of the Institution the alteration of the steam apparatus to allow of a lower pressure being used in heating the building, thus securing both enhanced safety and economy, and the more regular and effective supply of heat to some portions of the latter, has been brought to completion. This work has been done by our excellent engineer and his assistants without any outside help, and the intelligence, industry and energy, with which they have laboured during a period when some little respite from duty is usually to be expected is beyond all praise. The large amount of internal painting accomplished in the winter recess made any extensive work in this direction during the late vacation unnecessary.

#### THE GROUNDS.

My attention has been recently turned more particularly to beautifying the portion of the grounds lying nearest the city, and planting the new land in our rear with a view to its ultimate use as a park. Some four acres of the former have been laid down in permanent pasture and with, so far, excellent results. The trees and evergreens planted during the present year have been severely tried by the long prevailing drought and the intense heat of the season, but by frequent watering I am happy to report the majority have been preserved. We have had an uninterrupted and ample supply of water from our own spring, and I may hereafter submit a recommendation for the further saving, for outside purposes, of a large quantity which now runs to waste after all ordinary needs are supplied. I trust the good work of planting and ornamentation will receive in the coming estimates the usual friendly encouragement.

#### FARM AND GARDEN.

Our garden produce has been more prolific than at one time was to be expected, but in this and on our field crops the drought has told with serious effects. Our potato crop will fall short of our requirements, the tubers being small and in some instances immature

in appearance. A crop of oats which promised to do well turned out to be hardly worth the threshing. Mangolds and turnips will, it is probable, after all, give us a moderate average. On the whole we seem to have done quite as well as our neighbours or perhaps a little better than many.

#### IMPROVEMENTS SUGGESTED.

In view of the many beneficial improvements carried out during the past few years, I do not propose at this time to make any suggestions of a costly nature, unless it be once more to appeal to the liberality and intelligence of those in authority for the often asked for and much needed gymnasium. In the absence of any serious demands from this Institution upon the Treasury at the present time this boon might surely be granted.

#### ACKNOWLEDGMENTS.

Our circumstances during the past session did not admit of that free interchange of courtesies, which is generally so pleasant to all parties, between the officers and pupils of the Institution and the the citizens of Brantford. For a considerable time the Institution was closed to visitors altogether and our pupils were, on several occasions, much to their regret, denied the privilege of attending lectures, concerts and other amusements. The Christmas concert in our Music Hall, usually looked forward to with great pleasure, could not be held. The closing concert in June, however, was honoured by even a larger attendance than usual, numbers being unable to gain admittance owing to the crowd that filled the hall.

I must once more thank the clergy of the city for their continued interest in the welfare of the pupils and their attendance to our Sunday afternoon service. I desire also to acknowledge the generous tone and language of the local press during the trying period of sickness to which I have had in this report to make frequent reference.

I have the honour to be,

Sir,

Your obedient servant,

A. H. DYMOND,  
Principal.

Brantford, October 1st, 1887.

# ONTARIO INSTITUTION FOR THE BLIND.

STATISTICS FOR YEAR ENDING 30TH SEPTEMBER, 1887.

## I.—ATTENDANCE.

	Males.	Females.	Total.
Attendance for portion of year ending 30th September, 1872 .....	20	14	34
“ for year ending 30th September, 1873.....	44	24	68
“ “ “ 1874. ....	66	46	112
“ “ “ 1875.....	89	50	139
“ “ “ 1876.....	84	64	148
“ “ “ 1877.....	76	72	148
“ “ “ 1878.....	91	84	175
“ “ “ 1879.....	100	100	200
“ “ “ 1880.....	105	98	203
“ “ “ 1881.....	103	98	201
“ “ “ 1882.....	94	73	167
“ “ “ 1883.....	88	72	160
“ “ “ 1884.....	71	69	140
“ “ “ 1885.....	86	74	160
“ “ “ 1886.....	93	71	164
“ “ “ 1887.....	93	62	155

## II.—AGE OF PUPILS.

	No.		No.
Five years .....	1	Seventeen years .....	10
Six “ .....	3	Eighteen “ .....	9
Seven “ .....	2	Nineteen “ .....	8
Eight “ .....	3	Twenty “ .....	8
Nine “ .....	3	Twenty-one “ .....	8
Ten “ .....	9	Twenty-two “ .....	6
Eleven “ .....	10	Twenty-three “ .....	6
Twelve “ .....	7	Twenty-four “ .....	7
Thirteen “ .....	6	Twenty-five “ .....	2
Fourteen “ .....	13	Over twenty-five years.....	17
Fifteen “ .....	6		
Sixteen “ .....	11	Total... ..	155

## III.—NATIONALITY OF PARENTS.

—	No.	—	No.
American .....	5	Norwegian .....	1
Canadian .....	60	Scotch .....	16
English .....	36	Wendish .....	2
Irish .....	27		
French .....	6		
German .....	2	Total .....	155

## IV.—DENOMINATION OF PARENTS.

—	No.	—	No.
Baptist .....	11	Methodist .....	43
Congregational .....	5	Presbyterian .....	28
Children of Peace .....	2	Roman Catholic .....	23
Episcopalian .....	38	Salvationist .....	1
Christian .....	1		
Lutheran .....	3	Total .....	155

## V.—OCCUPATION OF PARENTS.

—	No.	—	No.
Actor .....	1	Manufacturer .....	1
Agent .....	5	Marble-worker .....	1
Baker .....	1	Merchant .....	8
Barber .....	1	Miller .....	1
Book-keeper .....	3	Painter .....	2
Blacksmith .....	4	Physician .....	2
Butcher .....	1	Sheriff .....	1
Carpenter .....	7	Soldier .....	1
Carpet-cleaner .....	1	Stone-mason .....	1
Clerk .....	3	Shoemaker .....	3
Conductor .....	1	Surveyor .....	2
Clergyman .....	1	Tailor .....	1
Cabinet-maker .....	3	Tanner .....	1
Drover .....	1	Tinsmith .....	1
Engineer .....	2	Tradesman .....	1
Farmer .....	48	Veterinary surgeon .....	1
Gardener .....	2	Waggon-maker .....	1
Fisherman .....	2	Weaver .....	1
Harness-maker .....	1	Unknown .....	6
Hotel-keeper .....	1		
Laborer .....	29	Total .....	155
Lawyer .....	1		

VI.—Cities and Counties from which pupils were received during the official year ending 30th September, 1887.

COUNTY OR CITY.	Male.	Female.	Total.	COUNTY OR CITY.	Male.	Female.	Total.
City of Belleville .....	0	1	1	District of Muskoka .....	2	0	2
County of Brant .....	2	2	4	County of Norfolk .....	0	1	1
City of Brantford .....	2	0	2	“ Northumberland .....	3	1	4
County of Bruce .....	2	3	5	“ Ontario .....	3	3	6
“ Carleton .....	1	0	1	City of Ottawa .....	3	0	3
“ Dundas .....	0	1	1	County of Oxford .....	0	1	1
“ Durham .....	0	0	0	“ Peel .....	1	0	1
“ Elgin .....	1	3	4	“ Perth .....	1	0	1
“ Essex .....	2	7	9	“ Peterboro' .....	2	0	2
“ Frontenac .....	2	0	2	“ Prince Edward .....	2	0	2
“ Glengarry .....	2	0	2	“ Prescott .....	1	0	1
“ Grenville .....	0	0	0	“ Renfrew .....	4	3	7
Grey .....	1	4	5	“ Russell .....	0	0	0
City of Guelph .....	1	0	1	City of St. Catharines .....	0	0	0
County of Haldimand .....	3	2	5	“ St. Thomas .....	1	0	1
“ Halton .....	1	0	1	“ Stratford .....	1	0	1
City of Hamilton .....	4	2	6	County of Simcoe .....	1	2	3
County of Hastings .....	0	1	1	“ Stormont .....	2	0	2
“ Huron .....	2	2	4	City of Toronto .....	10	2	12
City of Kingston .....	3	0	3	County of Victoria .....	2	0	2
County of Kent .....	0	3	3	“ Waterloo .....	1	1	2
“ Lambton .....	4	3	7	“ Welland .....	1	0	1
“ Leeds .....	2	0	2	“ Wellington .....	5	1	6
“ Lanark .....	0	0	0	“ Wentworth .....	0	3	3
“ Lennox .....	2	1	3	“ York .....	8	5	13
“ Lincoln .....	1	1	2				
City of London .....	4	1	5				
County of Middlesex .....	0	2	2	Total .....	93	62	155

VII.—Cities and Counties from which pupils were received from the opening of the Institution till 30th September, 1887.

COUNTY OR CITY.	Male.	Female.	Total.	COUNTY OR CITY.	Male.	Female.	Total.
City of Belleville .....	3	1	4	District of Muskoka .....	3	0	3
County of Brant .....	4	5	9	County of Norfolk .....	5	6	11
City of Brantford .....	6	5	11	“ Northumberland .....	2	7	9
County of Bruce .....	5	8	13	“ Ontario .....	6	6	12
“ Carleton .....	2	1	3	City of Ottawa .....	7	1	8
“ Dundas .....	2	2	4	County of Oxford .....	2	2	4
“ Durham .....	1	3	4	“ Peel .....	1	1	2
“ Elgin .....	2	3	5	“ Perth .....	2	8	10
“ Essex .....	4	10	14	“ Peterboro' .....	9	2	11
“ Frontenac .....	5	2	7	“ Prince Edward .....	3	2	5
“ Glengarry .....	4	0	4	“ Prescott .....	1	0	1
“ Grenville .....	2	0	2	“ Renfrew .....	7	4	11
“ Grey .....	6	9	15	“ Russell .....	1	1	2
City of Guelph .....	2	2	4	City of St. Catharines .....	2	0	2
County of Haldimand .....	4	4	8	“ St. Thomas .....	2	1	3
“ Halton .....	3	0	3	“ Stratford .....	2	0	2
City of Hamilton .....	9	8	17	County of Simcoe .....	4	7	11
County of Hastings .....	4	3	7	“ Stormont .....	4	0	4
“ Huron .....	6	6	12	City of Toronto .....	19	14	33
City of Kingston .....	5	3	8	County of Victoria .....	4	1	5
County of Kent .....	6	4	10	“ Waterloo .....	5	3	8
“ Lambton .....	6	3	9	“ Welland .....	3	2	5
“ Leeds .....	7	1	8	“ Wellington .....	9	5	14
“ Lanark .....	0	1	1	“ Wentworth .....	7	6	13
“ Lennox .....	3	1	4	“ York .....	14	9	23
“ Lincoln .....	3	3	6	Province of Quebec .....	2	0	2
City of London .....	7	8	15				
County of Middlesex .....	7	7	14	Total .....	244	191	435



VIII.—Cities and Counties from which pupils were received who were in residence on 30th September, 1887.

COUNTY OR CITY.	Male.	Female.	Total.	COUNTY OR CITY.	Male.	Female.	Total.
City of Belleville.....	0	1	1	District of Muskoka.....	2	0	2
County of Brant.....	2	2	4	County of Norfolk.....	0	0	0
City of Brantford.....	2	0	2	“ Northumberland... ..	0	1	1
County of Bruce.....	2	3	5	“ Ontario.....	2	3	5
“ Carleton.....	1	0	1	City of Ottawa.....	3	0	3
“ Dundas.....	0	1	1	County of Oxford.....	0	0	0
“ Durham.....	0	0	0	“ Peel.....	1	0	1
“ Elgin.....	0	3	3	“ Perth.....	0	0	0
“ Essex.....	1	4	5	“ Peterboro’.....	2	0	2
“ Frontenac.....	1	0	1	“ Prince Edward... ..	2	0	2
“ Glengarry.....	2	0	2	“ Prescott.....	1	0	1
“ Grenville.....	0	0	0	“ Renfrew.....	2	2	4
“ Grey.....	1	4	5	“ Russell.....	0	0	0
City of Guelph.....	2	0	2	City of St. Catharines.....	0	0	0
County of Haldimand.....	3	1	4	“ St. Thomas.....	2	1	3
“ Halton.....	1	0	1	“ Stratford.....	0	0	0
City of Hamilton.....	4	3	7	County of Simcoe.....	0	2	2
County of Hastings.....	0	1	1	“ Stormont.....	0	0	0
“ Huron.....	2	2	4	City of Toronto.....	9	2	11
City of Kingston.....	3	0	3	County of Victoria.....	2	0	2
County of Kent.....	0	3	3	“ Waterloo.....	1	1	2
“ Lambton.....	3	3	6	“ Welland.....	1	0	1
“ Leeds.....	1	0	1	“ Wellington.....	3	1	4
“ Lanark.....	0	0	0	“ Wentworth.....	0	1	1
“ Lennox.....	2	0	2	“ York.....	6	3	9
“ Lincoln.....	1	1	2				
City of London.....	3	1	4				
County of Middlesex.....	0	1	1				
				Total.....	76	51	127

## PHYSICIAN'S REPORT.

R. CHRISTIE, Esq.,

*Inspector of Prisons, Asylums, etc.*

SIR,—In submitting the Annual Medical Report of this Institution, it may be expected I should particularly allude to the outbreak of diphtheria which prevailed last session, to the exclusion of other subjects plainly of less importance.

Diphtheria is a disease often mysterious in its origin, diverse and obscure in its mode of propagation, uncertain in the choice of its subjects, and withal very capricious in the selection of its victims, striking down with unrelenting blow one member of a family, while another receives but the faintest touch of the same hand. It spares neither childhood, manhood nor old age, and it enters the homes alike of the poor and the rich; it prevails most in the crowded cities, but it has been known to follow the sportsman to his camp in the forest. Its spread has become so universal that in its ravages it may be regarded as one of the direst scourges of our time.

In presenting a connected history of this epidemic, reference must be made to the first case, a boy named John Alexander, aged fourteen, whom I was called to see, October 7th, 1886, at which time an examination revealed intense inflammation of the tonsils, upon which were such circumscribed patches of membrane as are frequently seen in simple tonsillitis. The boy was ordered to bed, and put upon the use of the ordinary remedies, such as tincture of aconite internally together with the chlorate of potash gargle. At the visit the following morning remarkable changes had taken place in the appearance of the throat in the intervening hours. True, diphtheritic membrane was observed covering the tonsils, the faucial pillars and the pharynx, generally, while the glands of the neck had become greatly swollen, the countenance dusky and the breathing difficult, and it was evident from these grave symptoms that the case was hastening to a fatal issue. To add to our misfortune it was discovered that two other young pupils were stricken by the same disease, and immediately, for the purpose of isolation and treatment, the three patients were placed in our hospital ward, which gave us such excellent service all through this trying ordeal.

The spectral presence of a contagious and fatal disease, projected without warning into a community of young children, was sufficiently appalling when all the possibilities were considered. It was at this juncture that yourself, as Inspector, and Dr. Bryce, Provincial Secretary of the Board of Health, were summoned to our aid by telegraph. By your prompt arrival the same evening, we had the benefit of Dr. Bryce's excellent counsel, not only in regard to the treatment of the sick children, but in suggesting the best precautionary measures to prevent the further spread of the disease, and in investigating the causes of the epidemic. Dr. Bryce kindly approved of the treatment entered upon, but advised an additional remedy in the inhalation of steam, medicated by turpentine and carbolic acid. The apparatus for the generation of steam was immediately extemporized, but all our efforts, though of the most energetic nature, could not rescue the lad Alexander, for he succumbed to his disease the following morning. The two remaining boys, aged about ten years, were now struggling heroically with the disease in a severe form, and though both were delicate in appearance, yet they maintained their ground against uneven odds, and were finally brought safely through.

The next on the list was a female servant, employed on the boy's side, whose attack proved to be mild in character, confining her to her bed for a few days only.

Other cases now occurred in quick succession, such as the young female nurse, engaged from the J. H. Stratford Hospital, who escaped with a brief illness. Then followed a boy, a companion of the boy Alexander, whose case, though somewhat prolonged, was never the cause of serious anxiety. There then ensued a considerable period of rest without new manifestations of the epidemic, and we began to grow confident we had seen the last of our enemy. Thus far, it will be observed, the disease had been confined to the male side of the house, and as a preventive measure all communication between the two wings had been as far as practicable broken off. But our hopes received a rude shock, for just one

month from the convalescence of one of the little boys above named, his young sister was suddenly prostrated by diphtheria. A week previously the two children had been allowed to come together, but not, of course, until a thorough disinfection of the boy's clothing and person had been accomplished. Whether the disease was communicated in this way must remain a matter of conjecture. I understand Dr. Bryce believes it possible, but if that theory be correct, why, it may be asked, did not this boy communicate the disease to some or other of his companions with whom he was continually mingling?

Something more than a passing reference should be made to the case of this little girl, on account of her remarkable recovery from what seemed certain death, and by which we learn the lesson never to relax our efforts to save our patients as long as life remains. Of course the disease was seen in this instance in its initiatory stages, and active treatment was at once entered upon, including the steam inhalations, but the disease progressed unchecked, the thick sloughy-appearing membrane finally covering the whole surface of the upper air passages, while the enormous swelling of the cervical glands gave the case an unpromising appearance. A still more threatening symptom arose in the form of profuse bleeding of the nose, caused, no doubt, by the separation of membrane in the nasal passages. Temporizing remedies were at first tried, but it was soon found that the flow of blood could be staunched only by plugging the nostrils. The loss of blood left the little patient with the pallor of death upon her countenance at every accession of hemorrhage. On one occasion, while I was present, she was observed in a convulsive struggle, and the little sufferer appeared to be in the last gasp, but the paroxysm ended in her coughing up a portion of thick tough membrane resembling an oyster. By the use of restoratives she soon rallied, and this event proved to be the turning point towards final recovery.

Still another case may be referred to, less fortunate in its results, but equally instructive. Later on in the epidemic a female pupil, aged 22 years, became the subject of diphtheria, and was placed under the same treatment as the others. There was nothing unusual in the early history of her illness, except that some laryngeal symptoms were developed, which gave us considerable anxiety. These, however, soon passed away, but in the progress of her illness an unlooked for complication occurred in the form of nausea and vomiting, necessitating the discontinuance of all active treatment and reducing the quantity of nourishment to the very minimum compatible with existence. As a natural result of this complication the heart's action became very feeble, threatening complete failure. Under these circumstances all our efforts were directed to sustaining the enfeebled heart, while for days the patient was not allowed to raise her head or make any bodily effort, but unfortunately all our efforts were in vain, for one morning a sudden change was noticed in her appearance, and before medical aid could be summoned she had passed away, death doubtless resulting from paralysis of the heart. In connection with this case it should be mentioned that Dr. Philip attended the patient, with me, throughout her illness, and also that her parents, having been apprized of the serious nature of her sickness, were present some days before her demise. I might add that Dr. Philip expressed not only a hearty approval of the plan of treatment adopted, but also gave his cordial co-operation in all the means employed to combat the epidemic.

As an example of the erratic nature of diphtheria the case of Jane Moffat may be mentioned, who had come very kindly to fill a vacancy in the laundry. She was taken down with the disease two weeks from the time of entering the Institution. Diphtheria is a disease supposed to belong almost exclusively to childhood and youth; here, however, was a woman 62 years old, whose age might seem proof against the possibility of contagion, but who takes the malady in severe form, the whole pharynx, roof of the mouth and nares being covered by membrane, which, with the cervical swelling and engorgement, caused great difficulty in breathing and swallowing. After days and nights of anxious watching, in which the chances seemed evenly balanced between life and death, a change for the better became finally apparent. After all trace of membrane had disappeared, and the patient had gained sufficient strength to sit up, it was thought prudent to have her removed to the J. H. Stratford Hospital during her slow convalescence, but I regret to say that after a stay in the hospital of several weeks she died rather suddenly, as I am informed, from probably one of the sequelæ of diphtheria.



As to the origin, or, as we say, the pathogenesis, of the disease in our Institution, of course the most reasonable supposition at the outset was that some serious defect in the sanitary appliances of the Institution would be found to explain the presence of such an epidemic; but after a most painstaking and exhaustive investigation by Dr. Bryce, no local cause could be ascertained as to the origin of the outbreak. This part of the inquiry has been sufficiently described in the supplementary portion of the Principal's report of last year, and therefore need not be repeated. With such negative results as this investigation supplied it was concluded that the boy, Alexander, having contracted diphtheria in some accidental manner, had brought it into the Institution. Further observation and experience, however, have convinced me that a wave of epidemic diphtheria passed over the city and the contagium vivum was carried on the wings of the wind. It is inconceivable that on a certain day or week the city became suddenly in an insanitary condition, its wells of water polluted or its drains untrapped, and that on a certain day or week two months later the water supply became suddenly purified or the defective drains repaired. Or if we conclude the disease was conveyed from person to person, why should not the disease be perpetuated indefinitely in this manner?

The essence or starting point of diphtheria is a micro-organism, germ or microbe, but when or how generated, when or how transported, sanitary science is not always able fully to explain.

The *diagnosis* of the disease is the subject of considerable diversity of opinion in the medical profession, some practitioners designating every simple inflammation of the tonsil diphtheritic, while others would confine the term to a well organized membrane in contradistinction to a mere secretion, which is often seen as a small white patch on the tonsil. The most doubtful cases are those which have been called amygdalitis lacunaris or follicular tonsillitis, where the exudation is seen in scattered white points only, but which are thought capable of communicating the disease in severe form, and experience certainly teaches that too many precautions can scarcely be taken to prevent the spread of the disease during any germ epidemic.

As to *treatment*, the therapeutical measures employed were both constitutional and local, equal stress being laid upon the two classes of remedies in counteracting the effects of a specific poison. Dr. Bryce concurred in the remedial measures employed, but, as already mentioned, suggested the use of steam inhalations medicated by turpentine and carbolic acid. In my own practice all such inhalations have been confined to cases where the lower air passages were involved, as in the laryngeal or tracheal (croupous) form, but none of our cases had this complication. Certainly our experience in the late epidemic did not prove that steam inhalations had any influence in modifying the course of the disease. I might remark in this connection that no remedies, however potential or judiciously selected, have the power of abridging the disease, and that the aim of the practitioner must be to guide it through its inevitable course to a successful issue, just as we do in typhoid fever. Indeed, the same careful attention to nourishment and to supporting measures generally, including the free use of stimulants, is often of as much importance in the one disease as the other. Both have a definite course to run and no amount of medication, however skilfully employed, will shorten that course by a single day. In the mild cases that course is short, in the malignant it is much prolonged, unless terminated by a fatal issue, and as a rule the medical attendant can determine on the second day to which class any given case will belong.

Our epidemic lasted, with intervals, for a period of nearly three months, in which time there was a total of twenty-five cases, two of which resulted fatally. It will be seen that this rate of mortality (8 per cent.) is very low, and is ground for encouragement to use every means in our power to keep the disease under control, and to husband the patient's strength till the disease has spent its force.

Disinfectants were profusely employed throughout the building, but it should be understood that disinfectants are merely deodorants as ordinarily used, and that a true disinfectant must be powerful enough to be destructive to life, whether that life be germ or human, hence the impracticability of employing disinfectants in any living apartment. The disinfection of clothing in close closets, or by means of steam or dry heat, presents one difficulty in getting the agent to penetrate sufficiently to accomplish its purpose.

Hence the necessity of destroying infected mattresses, etc., after all trace of the disease had disappeared from the Institution. The whole inside woodwork of the building received a coat of paint, and the plastered walls a coat of alabastine in order to cover any microbes which might adhere to these surfaces. No disinfectant can, however, be compared with fresh air, and when doors and windows can be thrown open long enough for free ventilation, the work will be thoroughly accomplished.

It may seem invidious to make comparisons where all performed their part so well, but justice compels me to mention the unwearied attentions of the Matron, Miss Dunn, whose cheerful presence gave hope and support to everyone, and whose footsteps were heard in ceaseless tread, by night and by day, up and down the long corridors in the discharge of her multifarious duties.

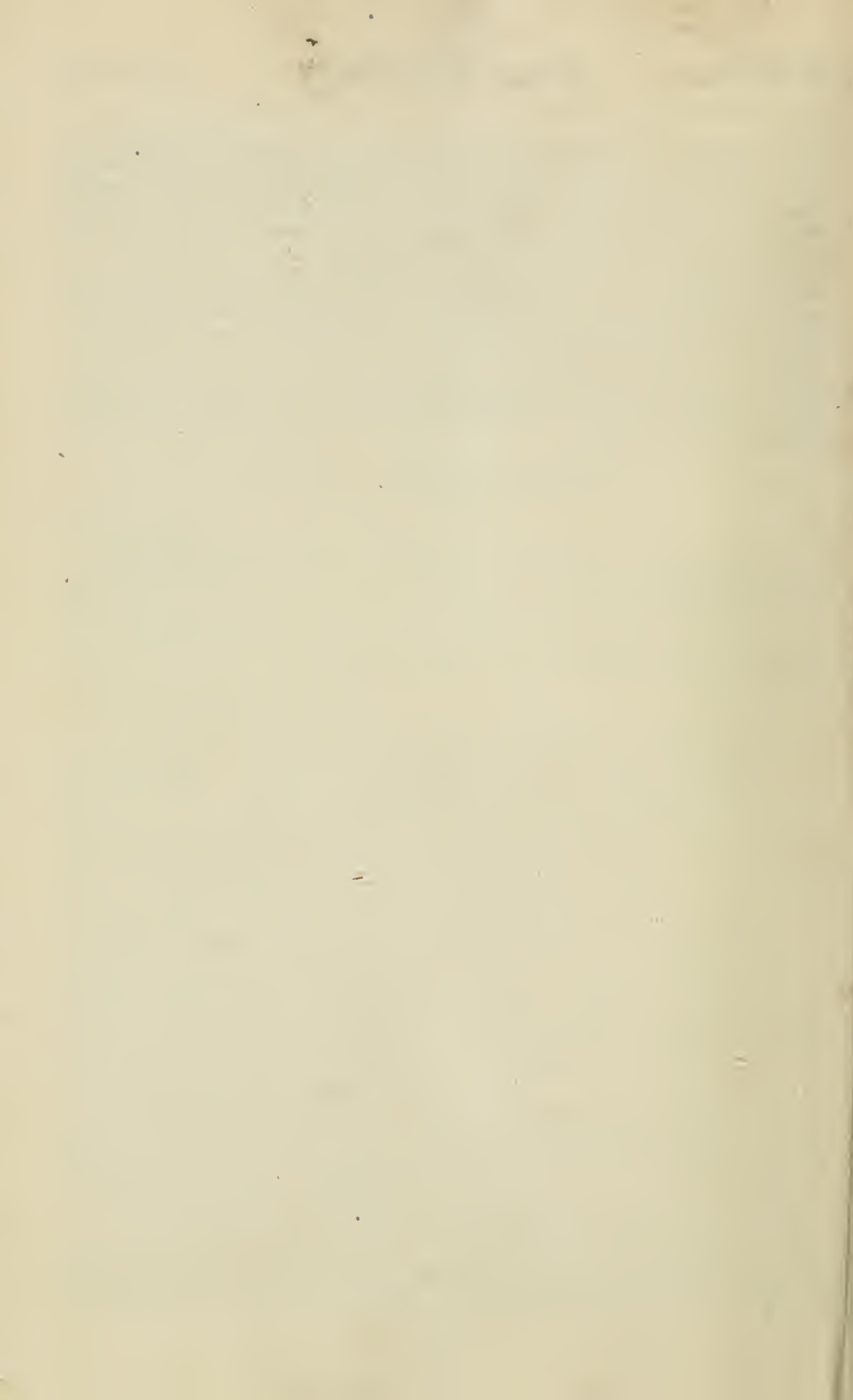
I am under lasting obligations to the Principal in anticipating as well as providing for every conceivable want. In our long and anxious daily consultations his firmness of purpose, kindness of heart and cordial co-operation, were of great service to myself in the performance of trying duties.

I have the honour to be,  
Yours very respectfully,

W. C. CORSON, M.D.,  
Physician.

Brantford, October 8th, 1887















BINDING SECT. AUG 23 1967

